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The LONDON NATURALIST

The Journal of THE LONDON NATURAL HISTORY SOCIETY

FOR THE YEAR
1935.

PRICE FIVE SHILLINGS.

PUBLISHED BY THE
LONDON NATURAL HISTORY SOCIETY,
THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE,
KEPPEL STREET, GOWER STREET, LONDON, W.C.1.

DATE OF PUBLICATION, 20th MAY 1936.

London Natural History Society.

Founded 1858.

Officers for 1935.

Offices in the Society and its Sections are Honorary.

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Minuting—H. J. BURKILL, M.A., F.R.G.S.;
Syllabus—J. B. FOSTER, B.A.;
Publications (and Editor)—B. T. WARD, 24 Long Deacon Road, Chingford, E.4.

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Lanternists:

Miss M. M. HOSE; Miss F. E. JOHNS; B. T. WARD.

The Society is affiliated to the British Association for the Advancement of Science; the South-Eastern Union of Scientific Societies; the Commons, Open Spaces, and Footpaths Preservation Society; and the Federation of Rambling Clubs.

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T. Buncle & Co. Ltd., Arbroath.

1936.

BRITISH MUSEUM
NATURAL HISTORY

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Editorial Notes.

THE activities of the Society are recorded in this volume, and continue to show a considerable amount of solid work both in the field and in the papers read at our Headquarters. Among the latter we are fortunate in securing an original paper by our Hon. President, Prof. Sir F. Gowland Hopkins, O.M., P.R.S.

The Annual Exhibition was held on 19th February; 191 members and visitors attended, an increase of 36 on the previous year. The exhibits, which numbered 49, were of a higher quality than in 1934. Our thanks are due to Mr C. L. Collenette for the hard work which its organisation and careful arrangement must have entailed.

We welcome the formation of an Ecological Section, and look forward to the results of its first year's work, which we hope to publish in our next issue.

We include the Eighth and last Part of the Botanical Records of the London Area. Further additions to this list will be published at some future date.

Our thanks are due to Miss Longfield for acting as our delegate to the Jubilee of the Dublin Naturalists' Field Club, which was held on 11th, 12th, and 13th July 1935. Miss Longfield presented the following address on vellum:—

> The London Natural History Society
>
> offers cordial greetings and sincere congratulations to the Officers and Members of
>
> The Dublin Naturalists' Field Club
>
> on the occasion of their Jubilee Meeting, July 1935. As fellow-workers and students of nature in the field, they welcome the friendship and co-operation of the Dublin Naturalists' Field Club in those branches of science in which the Societies hold mutual interest.
>
> On behalf of the President, Council, and Members,
>
> A. B. Hornblower,
> *Hon. Secretary.*

We would like to draw the attention of Members to the list, on page 20, of Referees who have kindly consented to give their services in questions of identification and for advice in various branches of Natural History.

We should like to urge Members to submit papers or short notes for publication. These should be sent to the Sectional Secretaries concerned not later than the end of October. Non-Sectional matter may be sent direct to the Editor.

STATEMENT OF ACCOUNTS 1935: GENERAL ACCOUNT.

Balance, 1st November 1934	£59 8 9
Interest on Post Office Account	1 8 6
Interest on £75 3½ per cent. Conversion Loan	2 12 6
Interest on National Building Society Share	0 9 11
Subscriptions and Entrance Fees	192 17 0
	£256 16 8

Rent		£31 17 6
Syllabus Expenses (Printing and Postages)		10 9 3
General Printing and Stationery		15 3 7
Postages (Secretary)		7 16 4
Postages (Treasurer)		1 10 10
Secretarial Expenses		1 12 0
Insurance		1 0 0
Gratuities		2 0 0
Subscriptions—Federation of Rambling Clubs	£0 7 6	
British Birds Marking Scheme	0 15 0	
South Eastern Union of Scientific Societies	0 7 6	
Commons, Open Spaces and Footpaths Preservation Society	0 10 0	
British Trust for Ornithology	0 10 0	
Entomologists' Monthly Magazine	0 15 0	
		3 5 0
Sectional Expenses—Ramblers	£3 0 0	
Entomology	2 0 0	
Plant Galls	1 0 0	
Ornithology	8 0 0	
Botany	2 10 0	
Archaeology	3 0 0	
		19 10 0
Expenses of Cinematograph Display		0 7 6
Binding		3 12 6
Ornithological Cabinet and Boxes		2 4 9
Secretary's Honorarium		25 0 0
Chingford Branch Expenses		4 18 6
Sundry Expenses		1 9 10
Transfer to *London Naturalist* Account		65 15 10
Transfer to Reserve Account		2 0 0
		£199 13 5
Balance at Bank, 31st October 1935		57 3 3
		£256 16 8

LONDON NATURALIST ACCOUNT.

Donations	£8 10 0	Printing	£70 5 0
Sales of *London Naturalist*	2 11 0	Blocks	2 9 0
Reprints and Maps	1 0 2	Postage	5 3 0
Transfer from General Account	65 15 10		
	£77 17 0		£77 17 0

LIFE COMPOSITION ACCOUNT.

Balance, 1st November 1934	£100 0 0	Balance, 31st October 1935—		
Life Membership Composition	10 0 0	£75 3½ per cent. Conversion Loan	£75 0 0	
Three Extra Payments on Higher Scale	15 0 0	National Building Society	50 0 0	
				£125 0 0
	£125 0 0			£125 0 0

RESERVE ACCOUNT.

Balance, 1st November 1934	£33 0 0	Balance, 31st October 1935—	
Transfer from General Account	2 0 0	At Post Office	£35 0 0
	£35 0 0		£35 0 0

Audited and found correct, 28th November 1935.

LEWIS EYNON,

C. L. COLLENETTE. *Auditors.*

F. G. DELL, *Treasurer.*

Council's Report, 1935.

THE year 1935 has seen further success in the annals of the Society. It has opened out a fresh path in the formation of a Section to study Ecology, and already great support has been afforded by members of previously existing Sections, who have welcomed the efforts of Mr L. Parmenter in bringing it into being.

The total number of adherents to the Society has shown a healthy growth, which, considering the increased subscriptions brought into effect this year, is a matter for special congratulation. The total influx of new Members was 39, Country and School Associates 9, Branch Associates 3, totalling 51, while the attrition was 25, 5, and 5 respectively, leaving a nett gain of 16. The average attendance at indoor meetings has been 71.5, and the Field Meetings have maintained a good attendance throughout.

The outstanding feature of the year was undoubtedly the address given by the President of the Royal Society (our Honorary President, Sir Frederick Gowland Hopkins) on the occasion of the Bacot Memorial Evening in April. The Cinematograph Evening in November was also extremely popular, no less than 131 being accommodated in or around our small hall. Throughout the whole year, however, our Syllabus Secretary, Mr J. B. Foster, has once more provided a splendid programme and thereby earned our heartiest gratitude.

The Library has been well patronised, and thanks are specially due again to Messrs Pethen and Mann for the continued patience and constancy with which they maintain its appeal and efficiency. Finance is in a satisfactory state, as may be seen by reference to the Treasurer's Report. *The London Naturalist* appeared in a new cover, and, under the fine editorship of Mr B. T. Ward, broke once again its previous record; Mr Ward has been obliged to relinquish this task, and the Council wish to record their thanks and congratulations to him. His place has been filled by Mr Graham Hopkins.

Records of Natural History events have come in well, but all the Recorders would still like to have more and from a larger number of observers; it is felt that the value of our records would be increased greatly if everyone who observes any special item for himself or herself would share it with the Society by sending a note of the observation to the appropriate Recorder.

And, with the same intention, the Council would once again urge the importance of each adherent trying to get at least one recruit each year, so that this History of Nature in our area may grow ever more complete.

A. B. Hornblower, *Honorary General Secretary.*

Librarian's Report, 1935.

DURING the year 293 books, manuscripts and other publications have been borrowed from the Library by sixty different members of the Society.

These books, etc., deal with the various branches of Natural History as follows:—General Natural History 84, Ornithology 71, Reports and Transactions of Kindred Societies 67, Entomology 36, Botany 20, Reptilia 6, Biology 4, Archaeology 2, Ichthyology 2, and Biography 1.

Since our last Annual Report, 148 books, manuscripts, and other publications have been received.

Of these additions to the Library, about a third consists of Reports and Publications of Kindred Societies, received in exchange for *The London Naturalist.*

With the annual grant made by the Council the following journals have been bound:—*Antiquity* (1 vol.), *Entomologist* (4 vols.), *Entomologists' Monthly Magazine* (4 vols.), *Entomologists' Record* (2 vols.), and *The Essex Naturalist* (2 vols.).

In the Library there is a typewritten catalogue, which is kept up to date as far as possible.

We again cordially invite enquiries from members as to the available books on any branch of Natural History in which they may be interested.

R. W. PETHEN,
E. MANN,
Honorary Librarians.

Archaeological Section.

REPORT FOR 1935.

THE Section has a present membership of 80, and the average attendance at excursions was 16 and at the indoor meetings 30. Eleven excursions were made during the year to churches and places of archaeological interest.

Although it might be thought that the activities of the Section in the past and the changes now in progress in its area had somewhat narrowed the field of its investigations, it is still found possible to break new ground. A case in point is the visit to the Abbey Folk Park at New Barnet, where, under the guidance of the Rev. Father Superior, a numerous party had the pleasure of seeing a novel enterprise which is already a conspicuous success.

The churches selected for record were St Peter upon Cornhill and Langley Marish, Bucks. They were found fully as interesting as the churches previously recorded, and under the able supervision of Mr G. J. B. Fox, records of great and lasting value have been compiled.

Topography was not neglected, and visits partaking of this character were made to Harrow and Downe, under the guidance of Mr Whitbread and the Chairman respectively. At Harrow, the School Buildings and Church were fully inspected.

A particularly successful excursion was that to Morden College, Blackheath, where the Chaplain, Mr Sim, conducted the party round the charming old buildings and picturesque precincts in a leisurely and informal manner.

Apart from the "Record" meetings, other churches were visited, At Kingsbury, Mr Forster conducted the Section round the new church of St Andrew, which is actually the old church of St Andrew, Well Street, re-erected on a new site. The splendid fittings designed by some of the leading artists of the last century have been transferred to the new church and were examined with much interest and admiration. The interesting old church of Kingsbury, close by, was also included in the ramble.

Theydon Garnon Church, Essex, was visited under the leadership of Mr Austin.

An enjoyable ramble to Chelsea Hospital was well attended, the itinerary including the Chapel, Dining Hall, and Wards.

Finally the Section maintained its custom of visiting Museums and Collections. At Brentford, the outstanding pre-historic, bronze and iron age antiquities were inspected under the guidance of Mr F. Turner, F.R.Hist.S., late Curator.

A large number of members were present at the visit to the College of Arms, when Mr Graham Vivian, Blue Mantle Pursuivant, exhibited many of the heraldic treasures of its library.

The lectures held under the auspices of the Section were "Natural History Lore in Elizabethan Times," by M. Burton, M.Sc., and "Saxon Crosses," by Arthur Gardner, F.S.A., the latter being arranged by the Section. In addition, there were lectures given at Sectional Meetings, viz.:—"Paleolithic Man in Southern England and Wales," by Dr J. D. Solomon; "Some Marshland Churches," by G. J. B. Fox; "The Wealden Iron Industry," by Edward Yates, F.S.A.

Miss H. Murphy has been elected to the Committee, but otherwise the officers are unchanged.

W. Cocksedge, *Chairman*.
C. D. Cocksedge, *Secretary*.

Botanical Section.

REPORT FOR 1935.

THREE general meetings have been arranged by the Section this year, the first being a talk by Mr J. Ramsbottom, O.B.E., M.A., on "Mushrooms and Toadstools." The second was a lecture by Prof. R. Ruggles Gates, D.Sc., LL.D., F.R.S., on the subject of "Chromosomes and Species," and the third was a talk by one of our members, Mr E. M. Payne, entitled "In British Mountain Flower Haunts." In addition to these, Mr J. E. S. Dallas gave an illustrated lecturette, at the Annual Exhibition, on "Some Alpine Flowers."

Three ordinary meetings have been held during the year, one taking the form of two short lectures by Messrs L. G. Payne and R. W. Robbins, who dealt with British Orchids and the family Gentianaceae respectively. The two remaining meetings were informal, and although no definite subject had been selected for discussion at these meetings they proved to be very interesting, since they gave opportunities for free discussion among the members; it is, therefore, regrettable that the attendances were not as large as they might have been.

The excursion syllabus included nine outdoor rambles and a visit to the Museum of the Imperial Institute, under the guidance of Mr H. Spooner. Three of the excursions were arranged with the main object of visiting recorded stations of *Eranthis hyemalis* Salisb., *Cardamine bulbifera* Crantz, and *Ranunculus sphaerospermus* (Hiern); the objective was achieved in each case.

The average attendance at the excursions has been 13, and at indoor meetings 17. The Section now has a membership of 140, which shows an increase of 13 over last year's figure.

The Curator has continued his work of rearranging the Herbarium during the year.

Among the plants recorded in the Society's District during the year the following are reported for the first time:—*Astragalus glycyphyllos* L. Discovered in a grassy roadside near Purfleet by members on a botanical ramble led by the Rev. P. H. Cooke. *Rapistrum rugosum* L. This European alien was seen in profusion on banks on the marshes at Purfleet on the same occasion. *Linaria italica* Trev. (identified by C. E. Britton). Several plants in a cornfield near Headley have been reported by Mr H. J. Burkill. This plant is somewhat intermediate between *L. vulgaris* Mill. and *L. supina* Desf. *Arctium nemorosum* Lej. A Burdock growing in a damp wood at Pains Hill, Limpsfield, found by Mr R. W. Robbins.

A number of lists have been received by the Recorder, adding welcome details of distribution, but species new to the District are seldom reported. Records of modern segregates of such genera as *Viola*, *Euphrasia*, *Centaurea*, etc., are needed, but they must be reliable, and should be supported by specimens.

HERMAN SPOONER, *Chairman*.
G. R. A. SHORT, *Honorary Secretary*.

Ecological Section.

REPORT FOR 1935.

AT a meeting of those interested in Ecology, held in September, a desire was expressed to form an Ecological Section. The Council's permission was obtained, and on October 29th twenty-eight members attended the first meeting of the Section.

The aims of the Section are to study Ecology, both individually and collectively; to promote the study of those branches of Natural History not covered by the other Sections; and to secure co-operation between the Sections in any special work undertaken. The first study to be attempted by the Section is that of Bracken (*Pteris aquilina*) and its associated flora and fauna. Areas of Bracken in Richmond Park and on Epsom Common have been selected for special study by groups under the leadership of Messrs C. L. Collenette and R. C. Homes respectively, who will be glad of any offers of assistance. Specialists are invited to work in these areas. Work on Bracken associations at other localities will be welcomed. Other corporate studies will be undertaken as the membership of the Section increases.

Details of the reading circles for the *Journal of Ecology* and the *Journal of Animal Ecology* may be obtained from the Secretary.

The Section is affiliated to the British Ecological Society.

R. W. ROBBINS, *Chairman.*
L. PARMENTER, *Honorary Secretary.*

Entomological Section.

REPORT FOR 1935.

SIX evening meetings were allotted to the Section during the year, and were filled as follows:—" Jottings of a Naturalist in France and Italy," by Mr J. A. Simes; " Variation in the Cream-spot Tiger Moth (*Arctia villica* L.)," by Dr E. A. Cockayne; " The Naturalist in the Laboratory " (Bacot Memorial lecture), by Prof. Sir F. Gowland Hopkins; " A Naturalist's Wanderings in Abyssinia," by Dr Hugh Scott; " The British Museum Expedition to the Mountains of East Africa," by Dr F. W. Edwards; and " Spiders, their life history and habits," by Mr E. A. Robins.

The attendance at the Sectional meetings has averaged 44, an improvement on that for the previous year.

Of the six field meetings, one, to Richmond Park, was abandoned on account of heavy rain. During a visit to Bookham and Ranmore Common, on 23rd June, the leader showed, as the main objective of the excursion, some interesting local varieties of *Zygaena*. On 14th July, in the Byfleet district, on a warm and sunny day, the rare Dragonfly, *Somatochlora metallica* Van der Linden, and 13 other species of *Odonata* were seen and studied. The annual larva hunt, on 8th September, was successfully carried through on Limpsfield Common and Chart, when Lepidoptera, Diptera, Saw-flies, Heteroptera, and Plant Galls were collected. An innovation was a visit to the Farnham House Laboratory on 19th October and to the Insectaries at the London School of Hygiene and Tropical Medicine on 16th November.

The attendance at the excursions has averaged 9, which is also an improvement on that for the previous year.

Mr E. A. Aris having resigned the post of Curator, Mr E. B. Pinniger has been appointed in his place. A total of 172 British Butterflies has been kindly presented by the British Museum (Natural History) to supply vacancies in the Society's collection.

Reading circles for the *Entomologist* and *Entomologists' Monthly Magazine* are in existence, and members wishing to join the same may obtain particulars from Mr R. W. Robbins.

The annual review on the Butterflies has been compiled by Mr H. J. Burkill, from reports sent in, and will be found on page 67.

R. B. Benson, *Chairman.*
C. L. Collenette, *Hon. Secretary.*

Ornithological Section.

REPORT FOR 1935.

GENERAL.

THE Section was indebted again this year to the Royal Society for the Protection of Birds for its kind co-operation in arranging for two of the Prize-winning Essays in the Annual Public Schools Essay Competition to be read to the Society. Although neither Mr S. Baron nor Mr R. J. F. H. Pinsent were able to be present on January 8th, the essays were read and the meeting accorded its congratulations to both prize-winners for the excellent and entertaining observations they had recorded in their papers.

Six other lectures were arranged during the year, and while it is difficult to differentiate when papers read to the Society are all on a high level, Mr J. Berry's paper, "Problems of Identification of Geese," and Mr Ian M. Thomson's lecture, "The Bittern and its Neighbours," call for special mention.

The informal meeting which was arranged on July 16th, when Mr E. M. Nicholson spoke on the objects and activities of the British Trust for Ornithology, must also be recorded, as his lucid explanations of the aims and objects of the Trust only emphasised the need for all Ornithologists to assist in making the Trust a real success. Further details in connection with the work the Section is undertaking will be found later in this Report.

The membership of the Section has continued to increase this year, and the total number of members now stands at exactly 300, a net increase of 24 on last year's figure. Thirty-one new members and seven resignations account for the increase mentioned above.

FIELD MEETINGS, 1935.

Twenty Field Meetings have been held during the year, at which the attendance has varied between 5 and 35, the average being 16.

The districts visited included:—The marshes of Munden and Battlesbridge in Essex; Kent Marshes at High Halstow; the North Downs in the neighbourhood of Guildford, Godstone and Gomshall; the Chiltern Hills in Buckinghamshire; Bookham, Effingham, and Oxshott Commons; the Black Park and Windsor Great Park; and Tring, Staines, and Walthamstow Reservoirs.

The total number of species identified on these excursions was 119, and included:—Siskin, Crossbill, Cirl Bunting, Wood-lark, Wryneck, Red-breasted Merganser, Bar-tailed Godwit, Whimbrel, Jack Snipe, Woodcock, Black Tern, and Razorbill.

CURATOR'S REPORT.

The Collections have been increased by 19 Photographs and 81 Skins this year. The donors were Miss L. M. Frederick, Messrs H. Bentham, H. Candler, S. A. Chambers, R. S. Fitter, J. P. Hardiman, N. H. Joy, R. B. Lodge, A. Holte Macpherson, G. E. Manser, J. H. Owen, B. T. Ward, and the British Museum (Nat. Hist.).

The thanks of the Section are tendered to these members and friends for their gifts, and also to Messrs Hanson and Ward, who continue to make skins for the Section from birds found dead in the field.

Another cabinet and boxes have been provided for the growing collections, which, it is pleasing to note, are being used to a much greater extent than in the past.

READING CIRCLES.

The attention of members is again drawn to the Section's Reading Circles, and their popularity is demonstrated by the fact that three Journals, viz., *British Birds*, *The Scottish Naturalist*, and *The Journal of Animal Ecology*, are regularly read by 56 members of the Society. There are some vacancies in the *British Birds* Reading Circles, the annual subscription to which is 2/6.

Additional Circles could be arranged for *The Scottish Naturalist*, providing sufficient applications are received. All enquiries and requests for membership to any of the Reading Circles should be made to the Reading Circle Secretary.

S. Austin, *Chairman.*
D. H. Clanchy, *Honorary Secretary.*

Plant Galls Section.

REPORT FOR 1935.

TWO meetings were allotted to the Section during the year, and at both of these papers embodying details of research work were read. On 22nd January the Secretary dealt with the Galls found on *Salix*, and Mr Niblett described the insects he had bred from such Galls. On 12th November Mr Niblett contributed some "Notes on Recent Work." Exhibits and communications at these meetings were of considerable interest to the audiences. The average attendance, including that at the Annual General Meeting of the Section, was 14.3, a slight falling off from the previous year.

Ten outings were planned, and eight of them were successfully carried through. We visited Edgware, 11th May; Limpsfield, 18th May; Abbey Wood, 1st June; Tadworth and Colley Hill, 20th June; Epsom Downs, 17th August; Ockham Common, 31st August; Friday Street, 14th September; and Epsom Common, 21st September. The average attendance has shown a falling off from the previous year, probably due to the weather, and numbered only 4 per outing, but many valuable observations were made, although there was a reduction in the number of species recorded. The list of the more noteworthy finds appears on p. .

Mr Niblett, the Curator, reports that the collection of specimens has been added to, and has been maintained in good condition during the year.

J. Ross, *Chairman.*
H. J. Burkill, *Honorary Secretary.*

Ramblers' Section.

REPORT FOR 1935.

ELEVEN rambles have been held. Attendance at these has varied between 3 and 18, the average being 9. As in other years, these rambles have been pleasantly varied, and the districts visited have included:—Boxhill, Ranmore Common, Epsom Downs, the Pilgrims' Way, Dukes' Warren, Wisley, Edenbridge, Penshurst, East Grinstead, the Chiltern Hills, Boxmoor, and Broxbourne. In addition, the Section arranged a visit to the Whipsnade Zoo. Although no official records are kept, many things of interest have been seen on these walks, and our thanks are due to the leaders for the trouble taken in finding out field and woodland paths "far from the madding crowd."

Two Sectional meetings have been held, one in the spring, when Mr J. E. Roberts, B.Sc., gave a lecture entitled "Afoot in Portugal and

Spain," and one in the autumn, when short lectures were given by Miss E. Stephens, of Cape Town, on "A Waterside Trek in Sub-Tropical Africa," and Mr C. Weeks on "Rambling in Germany."

The Section has also been responsible for lectures at two General Meetings, viz., "To the Mountains of the Moon," by Miss C. E. Longfield, and "Wild Life off the Beaten Track," by Mr Montagu Phillips.

E. L. King, *Chairman.*
Olive King, *Secretary.*

Chingford Branch.

REPORT FOR 1935.

THE Chingford Branch had eight indoor meetings during the year, and a variety of subjects were discussed. There was a fair average attendance at these meetings, and much interest was aroused by the topics presented by the lecturers. An innovation was a group of lecturettes illustrated by cinematograph films.

The following lectures were delivered:—"The Romance of the Dinosaurs," J. F. Hayward, B.Sc.; "Some Old German Towns," W. C. Cocksedge; "Marine Life" and "Tombs and Temples of the Pharaohs," Rev. H. J. Gamble, M.A.; "The Pageant of the Garden," F. G. Gould; "Nature through the Year," J. Ross, E. T. Nicholson, E. B. Pinniger, J. F. Hayward, B.Sc.; "To the Mountains of the Moon," Miss C. E. Longfield, F.R.G.S., F.R.E.S., F.Z.S.; "Tyrol and Thereabouts," W. J. Foster, LL.B.; "The Early Inhabitants of the Lower Lea," Mrs A. R. Hatley, B.Sc., F.R.G.S.

A number of visits to Epping Forest were also arranged.

As usual, the Branch has to thank Miss M. L. Mathieson for her monthly weather report, which forms a regular and valuable feature of the meetings.

At the end of the year Rev. H. J. Gamble, M.A., retired from the position of Chairman, which he had held for many years. During that period he worked whole-heartedly for the welfare of the Branch and the Society as a whole, and the thanks of all members are due to him for the splendid spirit with which he carried out his duties.

It should be added in conclusion that the Branch continues to be of use to the Society, both as a recruiting ground for new members and as a means of introducing new lecturers.

John F. Hayward, *Local Secretary.*

Papers Read to the Society.

WE wish to offer our grateful thanks to those visitors who, by coming to lecture to us, have added so much to our enjoyment:—

Jan. 1—"Natural History Lore in Elizabethan Times,"
M. Burton, M.Sc.
,, 15—"Mushrooms and Toadstools," J. Ramsbottom, O.B.E., M.A.
Feb. 5—"Birds and their Fossil Ancestors," ... J. F. Hayward, B.Sc.
,, 19—Annual Exhibition.
(1) "Some Alpine Flowers," .... J. E. S. Dallas.
(2) "Variations in Eggs," .... L. Gunton.
Mar. 5—"To the Mountains of the Moon,"
Miss C. E. Longfield, F.R.G.S., F.R.E.S., F.Z.S., M.B.O.U.
,, 19—"Wild Life at Home," .... J. E. Roberts.
April 2—Bacot Memorial Evening:
"The Naturalist in the Laboratory,"
Prof. Sir F. Gowland Hopkins,
O.M., M.A., M.D., F.R.C.P., P.R.S.
,, 16—"Bird Life around Port Jackson,"
E. J. Brice, F.R.G.S., R.A.O.U.
May 7—"Chromosomes and Species,"
Prof. Ruggles Gates, D.Sc., LL.D., F.R.S.
,, 21—"Problems of Identification of Geese," .... J. Berry.
June 4—"A Naturalist's Wanderings in Abyssinia,"
H. Scott, Sc.D., F.L.S., F.R.E.S.
Sept. 17—"The Bittern and its Neighbours," .... Ian M. Thomson.
Oct. 1—"Wild Life off the Beaten Track,"
Montagu A. Phillips, F.L.S., F.R.G.S.
,, 15—"Saxon Crosses," .... Arthur Gardner, F.S.A.
Nov. 5—"Spiders: their Life History and Habits,"
E. A. Robins, F.L.S.
,, 19—Cinematograph Films:
"The Heron, the Hobby, and other Birds of Southern Europe," .... K. R. S. Morris, Ph.D.
Dec. 3—Annual General Meeting.
President's Address:
"Some Sea Birds," .... J. E. S. Dallas.
,, 17—"In British Mountain Flower Haunts," ...... E. M. Payne.

PAPERS READ AT SECTIONAL MEETINGS.

Jan. 8—Ornithology. Prize-Winning Essays in Public Schools Competition of R.S.P.B.:
"Personal observations on the nesting sites of six species of British Wild Birds."
(a) S. Baron. (b) R. J. F. H. Pinsent.

,, 22—Plant Galls.
(1) "Galls on *Salix*," .... H. J. Burkill, M.A., F.R.G.S.
(2) "Insects from *Salix* Galls," .... M. Niblett.
Feb. 12—Entomology. "Jottings of a Naturalist in France and Italy," J. A. Simes, O.B.E., F.R.E.S.
Mar. 12—Archaeology. "Paleolithic Man in Southern England and Wales," .... Dr J. D. Solomon.
,, 26—Ornithology. "Notes from Noss," .... H. N. Southern.
April 9—Archaeology. "Some Marshland Churches," G. J. B. Fox.
May 14—Entomology. "Variations in the Cream Spot Tiger Moth," E. A. Cockayne, M.A., D.M., F.R.C.P., F.R.E.S.
,, 28—Botany.
(1) "British Orchids," .... L. G. Payne.
(2) "British Gentians," .... R. W. Robbins.
June 18—Ramblers. "Afoot in Portugal and Spain," J. E. Roberts, B.Sc.
July 16—Ornithology. "The British Trust for Ornithology," E. M. Nicholson.
Sept. 10—Archaeology. "The Wealden Iron Industry," Edward Yates, F.S.A.
Oct. 8—Entomology. "The British Museum Expedition to the Mountains of East Africa," ... F. W. Edwards, M.A., Sc.D.
Nov. 12—Plant Galls. "Notes on Recent Work," .... M Niblett.
,, 26—Ornithology. "The Cuckoo: Facts and Fallacies," P. F. Bunyard, F.Z.S., M.B.O.U.
Dec. 10—Ramblers.
(1) "A Waterside Treck in Sub-tropical Africa," Miss E. M. Stephens.
(2) "Rambling in Germany," .... C. Weeks.

Obituary.

FREDERICK RICHARD FINCH.

It is with very great regret that we intimate the death of Frederick Richard Finch, who died on 7th March, 1936, in his 65th year. He is survived by his widow and one son. Finch's earlier days were spent in the Lancashire town of Southport, where he was born on 1st October, 1871, and where he received his preliminary scholastic instruction. He commenced at the early age of four in Miss Feugh's Day School and later became a pupil in Mr Hobson's Preparatory School, Rockley House. At the age of fourteen he was enrolled at Rugby School, Mr Mitchell's House, and on 25th May, 1889, he won the Queen's Rugby Gold Medal, i.e., the Brackenbury Exhibition for Modern History. In the autumn of the following year he went to Balliol College, Oxford, when his exhibition was converted into the Brackenbury Scholarship for Modern History. He took the degree of B.A. in 1894. He continued his study of Law firstly in Lancashire and then in London, and was called to the Bar on 26th January, 1898, in which year he moved to 4 Stone Buildings, Lincoln's Inn, which remained his professional address until his death.

The first signs of his great affliction manifested themselves in 1904, and ten years later he was seriously deaf. He was obliged to confine himself to conveyancing, in which he was accomplished. He assisted in editing the 13th edition, published in 1932, of Key and Elphinstone's *Precedents in Conveyancing*, a very celebrated work. At the outbreak of the great war he volunteered his services to the War Office, but was rejected on account of deafness. He worked at the Home Office during hostilities. Finch included among his recreations mountaineering, he was a member of the Alpine Club, and the study of architecture, of which he had sound knowledge resulting from the inspection of many ancient buildings. In later years he devoted his spare time mainly to ornithology, in which he was very enthusiastic. His interest in birds started about 1922, but it was not until six years later that the subject became so much to him, this resulting from the influence of Mr A. Holte Macpherson, to whom he conveyed that the study of birds had done much to promote his happiness. Finch joined the Society in 1929, and annually contributed records to *The London Naturalist*. He also sent notes to *British Birds* and elsewhere. His identifications in the field were very reliable, and he was equally accurate in clerical work, as the present writer can testify from the manner in which he checked his proofs.

In spite of his affliction he was a genial companion, ready to tell and hear a good story. The death of F. R. Finch removes from our midst a big-natured man and creates for those who had the pleasure of his company a gap which will not be easily filled. He has been laid to rest in appropriate sylvan surroundings at Long Ditton.

W. E. G.

CHARLES HENRY WILLIAMS.

Charles Henry Williams was born in Camberwell in 1851, and died on February 22nd, 1936, at the age of 85. Left an orphan before he was nine years old, the manager of his father's brass foundry sold up his home and effects and decamped with the proceeds, leaving him penniless. He had to leave school and make his own way in the world, but, though he regretted his lack of education, he was not embittered by this sad experience.

Even at the age of five he was fascinated by the beauty of the butterflies in his father's garden, and soon began to collect them and invent names for them, and throughout his long life he never lost his interest in entomology. Joining the City of London Entomological Society in 1880, he remained after the amalgamation a member of the London Natural History Society until 1933, when he resigned owing to ill-health.

Charlie Williams, as he was affectionately known, was a character, and no one who took part in the field meetings will ever forget him.

Wearing a top hat and tailed coat and carrying a little brown handbag in one hand and a net in the other, he used to cover a small area thoroughly, and was nearly always rewarded by the best captures of the day. At tea afterwards he was the life and soul of the party, telling most amusing stories, often at his own expense.

Inheriting his father's love for the organ, he became an accomplished musician, and for a time held a post as organist, only relinquishing it on his doctor's advice.

The cheery optimism which carried him through the hardships of his early life gave him happiness in the years of his prosperity and never deserted him even in his long illness. A man with no enemies and many friends, he will be sadly missed.

E. A. C.

Referees.

THE following have kindly consented to act as Referees on questions of identification and for advice in various branches of Natural History.

It should be clearly understood that Referees cannot undertake work of an onerous nature, such as the determination of collections.

Postage for reply should always be enclosed and a request inserted for the return of the specimens if desired.

BOTANY.

General.—R. W. Robbins, Bullens Lee, Pains Hill, Limpsfield, Surrey.
Genus *Rosa*.—E. B. Bishop, Lindfield, Marshall Road, Godalming, Surrey.
Umbelliferae.—L. G. Payne, 22 Marksbury Avenue, Richmond, Surrey.
Rushes and Sedges.—E. B. Bishop, Lindfield, Marshall Road, Godalming, Surrey.
Grasses.—R. W. Robbins, Bullens Lee, Pains Hill, Limpsfield, Surrey.
Ferns and Horsetails.—L. G. Payne, 22 Marksbury Avenue, Richmond, Surrey.
Mosses and Liverworts.—J. Ross, 23 College Gardens, Chingford, E.4.
Lichens.—**Vacant.**
Fungi.—Vacant.
Mycetozoa.—J. Ross, 23 College Gardens, Chingford, E.4.
Medicinal Plants.—G. R. A. Short, 36 Parkside Drive, Edgware, Middlesex.
Aquatic Plants.—H. J. Jeffery, A.R.C.S., F.L.S., 14 Coppetts Road, Muswell Hill, N.10.
Algae (including Seaweeds).—A. D. Cotton, O.B.E., F.L.S., Royal Botanic Gardens, Kew, Surrey.

GEOLOGY.

John F. Hayward, B.Sc., 17 Heathcote Grove, Chingford, E.4.

MINERALOGY.

F. A. Bannister, M.A., 34 Monahan Avenue, Purley, Surrey.

PALAEONTOLOGY.

E. I. White, Ph.D., F.G.S., British Museum (Natural History), S. Kensington, S.W.7.

INVERTEBRATA.

Mollusca.—J. R. le B. Tomlin, 23 Boscobel Road, St Leonards-on-Sea, Sussex.

Protozoa, Porifera (Sponges), Coelenterata (Jelly-fish, Sea-anemones and Corals), Vermes, Polyzoa, Brachiopoda, Echinodermata.—M. Burton, M.Sc., F.Z.S., British Museum (Natural History), S. Kensington, S.W.7.

Crustacea.—Vacant.

Myriapoda (Centipedes and Millepedes).—Vacant.

Insecta:—General.—C. L. Collenette, F.R.E.S., 112 The Terrace, Richmond, Surrey.

- Thysanura (Bristle-tails) and Collembola (Spring-tails).—J. M. Brown, B.Sc., F.R.E.S., 176 Carterknowle Road, Sheffield, 7.
- Orthoptera (Earwigs, Cockroaches, Locusts, Crickets, etc.).—K. H. Chapman, B.A., British Museum (Natural History), S. Kensington, S.W.7.
- Plecoptera (Stone-flies) (*Specimens in fluid only*).—M. E. Mosely, 43 Lansdowne Crescent, W.11.
- Psocoptera (Book-lice, etc.).—D. E. Kimmins, 16 Montrave Road, Penge, S.E.20.
- Anoplura (Lice).—G. B. Thompson, British Museum (Natural History), S. Kensington, S.W.7.
- Ephemeroptera (May-flies).—D. E. Kimmins, 16 Montrave Road, Penge, S.E.20.
- Odonata (Dragon-flies).—E. B. Pinniger, 19 Endlebury Road, Chingford, E.4.
- Thysanoptera (Thrips).—Edward R. Speyer, M.A., Experimental and Research Station, Cheshunt, Herts.
- Hemiptera (Bugs, Cicadas, Leaf-hoppers, etc.).—W. E. China, M.A., British Museum (Natural History), S. Kensington, S.W.7.
- Neuroptera (Lace-wings, Ant-lions, Alder and Scorpion-flies, etc.).—D. E. Kimmins, 16 Montrave Road, Penge, S.E.20.
- Trichoptera (Caddis-flies) (*Specimens expanded only*).—M. E. Mosely, 43 Lansdowne Crescent, W.11.
- Lepidoptera (Butterflies and Moths).—R. W. Robbins, Bullens Lee, Pains Hill, Limpsfield, Surrey.
- Coleoptera (Beetles).—K. G. Blair, D.Sc., F.R.E.S., 120 Sunningfields Road, Hendon, N.W.4.
- Hymenoptera (Ants, Bees, Wasps, etc.).—R. B. Benson, M.A., F.R.E.S., British Museum (Natural History), S. Kensington, S.W.7.

Diptera (Flies, Gnats and Midges).—L. Parmenter, F.R.E.S., 94 Fairlands Avenue, Thornton Heath, Surrey.

Siphonaptera (Fleas).—G. B. Thompson, British Museum (Natural History), S. Kensington, S.W.7.

Arachnida (Spiders, Scorpions, Harvesters, Mites, etc.).—E. A. Robins, F.L.S., 19 Casiobury Park Avenue, Watford, Herts.

VERTEBRATA.

Fishes.—J. R. Norman, F.Z.S., British Museum (Natural History), S. Kensington, S.W.7.

Amphibians and Reptiles.—L. G. Payne, 22 Marksbury Avenue, Richmond, Surrey.

Birds:—Distribution and Identification. For the Society's Area, N. of Thames.—The Recorder, R. C. Homes, 170 Manor Green Road, Epsom, Surrey.

For the Society's Area, S. of Thames.—The Recorder, Claude Weeks, 3 Stanhope Gardens, Highgate, N.6.

Outside Society's Local Area.—The Hon. Secretary of Records Committee, R. C. Homes, address as above.

British Trust for Ornithology.—The Society's Representative, R. C. Homes, address as above.

Anatomy.—G. Carmichael Low, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U., 86 Brook Street, Grosvenor Square, W.1.

Nests and Eggs.—J. E. Roberts, B.Sc., Fairhaven, Bond Road, Surbiton, Surrey.

Mammals.—M. A. C. Hinton, F.R.S., British Museum (Natural History), S. Kensington, S.W.7.

PLANT GALLS.

H. J. Burkill, M.A., F.R.G.S., 3 Newman's Court, Cornhill, E.C.3.

ECOLOGY.

L. Parmenter, F.R.E.S., 94 Fairlands Avenue, Thornton Heath, Surrey.

CHEMISTRY.

L. Eynon, B.Sc., F.I.C., Fernleigh, Hall Lane, Upminster, Essex.

RIGHTS OF WAY, FIELD PATHS, Etc.

Sir Lawrence Chubb, 71 Eccleston Square, Westminster, S.W.1.

List of Members.

(Corrected up to 14th April 1936.)

It is particularly requested that Members will inform the Secretary as soon as possible of any change of address.

Honorary President:

Prof. Sir Frederick Gowland Hopkins, O.M., M.A., M.D., F.R.C.P., F.R.S.

Honorary Vice-Presidents:

Sir Lawrence Chubb. Prof. M. Greenwood, D.Sc., F.R.S., F.R.C.P. F. J. Hanbury, F.L.S., F.R.E.S. A. Holte Macpherson, B.C.L., M.A., F.Z.S. L. B. Prout, F.R.E.S. J. Ross.

Honorary Members:

1933 Bryce, E. J., Nelson Road, Killara, Sydney, N.S.W. (Zoo.)
1894 Burrows, Rev. C. R. N., F.R.E.S., 2 West Hill, Fairview Avenue, Stanford-le-Hope, Essex. (Lep.)
1927 Le Souef, A. S., C.M.Z.S., R.A.O.U., Taronga Zoological Park Trust, Sydney, Australia.
1899 Massey, Herbert, M.B.O.U., F.R.E.S., Ivy Lea, Burnage, Didsbury, Manchester. (Lep., Orn., Ool.)

Members:

1927 Aldred, Miss K. V., 5 Ladbroke Court, Ladbroke Gardens, Notting Hill, W.11. (Arch., Orn.)
1922 Aldred, Miss M., Flat 5, 21 Ladbroke Gardens, Notting Hill, W.11. (Orn.)
1928 Alexander, O. A., 35 Ellington Road, Hounslow, Middlesex. (Ent.)
1932 Angell, Miss K. W., at 104 Broxholm Road, West Norwood, S.E.27. (Orn., Ent., R., Ecol.)
1932 Arbon, Mrs J. A., Brookside, Eversley Park Road, Winchmore Hill, N.21. (Arch.)
1925 Archbould, R. S., Forest Way, Loughton, Essex. (Orn.)
1915 Aris, E. A., F.Z.S., 9 Oak Avenue, Priory Road, Hornsey, N.8. (Lep.)
1932 Arnold, Miss W., 43 The Quadrant, Wimbledon, S.W.19. (Orn.)
1892 Austin, S., F.Z.S., 43 Darenth Road, Stamford Hill, N.16. (Orn., Arch., R., Ecol.)
1931 Axford, W. G., Surgeon Rear Admiral, C.B., F.L.S., 5 King Edward Mansions, 212a Shaftesbury Avenue, W.C.2. (Bot.)
1931 Back, Dr Marjorie, 16 Daisy Lane, Fulham, S.W.6. (Bot., Orn.)
1934 Baggaley, W., 12 Ashridge Close, Kenton, Harrow, Middlesex. (Orn., R.)
1929 Baggallay, Miss J., 55 Ridgway Place, Wimbledon, S.W.19. (Orn.)

1929 *Bagnall, R. S., D.Sc., F.R.S.E., 9 York Place, Edinburgh. (Pl. G., Ent., Bot.)

1927 Baily, Miss A. R., F.Z.S., Cressex Lodge, Binfield, Berks. (Arch., Bot., Orn., Ent., Pl. G., R.)

1924 *Baker, E. C. Stuart, J.P., O.B.E., F.Z.S., F.L.S., M.B.O.U., H.F.A.O.U., 6 Harold Road, Upper Norwood, S.E.19. (Orn.)

1934 Banks, H., 172 Cromwell Road, Hounslow, Middlesex. (Bot., Orn.)

1927 Barclay-Smith, Miss P., F.Z.S., M.B.O.U., Park Lodge, Hervey Road, Blackheath, S.E.3. (Orn.)

1926 Barnes, Mrs E. C., M.B.O.U., 117 Sloane Street, S.W.1. (Orn., Bot., Ecol.)

1933 Bastian, Miss S., 49 Tavistock Square, W.C.1.

1932 Bastick, Miss M. E. S., 81 Gunterstone Road, Baron's Court, W.14. (Bot.)

1903 *Battley, Mrs, 47 Gordon Road, Ealing, W.5.

1932 Bayliss, C. V., 14 Conan Mansions, West Kensington, W.14. (Arch.)

1915 Bayne, Charles S., Room 303, Salisbury House, Salisbury Square, E.C.4. (Orn., Ecol.)

1934 Becher-Bingham, E., 141 Half Moon Lane, Herne Hill, S.E.24. (Ent., Orn.)

1931 Becher-Bingham, N. F., 141 Half Moon Lane, Herne Hill, S.E.24. (Orn., Ent.)

1934 Benham, Miss E. K., 1a Queensberry Place, S. Kensington, S.W.7. (Bot., Orn.)

1926 Benn, Miss A., 68 South Esk Road, Forest Gate, E.7. (Orn., Ent., Pl. G., Ecol.)

1931 Benson, Mrs R. B., Dellfield, Featherbed Lane, Felden, Boxmoor, Herts. (Orn., Bot.)

1929 *Benson, R. B., M.A., F.R.E.S., F.Z.S., British Museum (Natural History), South Kensington, S.W.7. (Bot., Orn., Ent., esp. Sawflies, Ecol.)

1932 Bentham, C. H., Eothen, Epsom Lane, Tadworth, Surrey. (Orn.)

1932 Binley, Miss E. M., 197 Camberwell Grove, Camberwell, S.E.5. (Orn.)

1935 Birnie, Miss V. M. O., 23 Hillway, Highgate, N.6. (Orn., R.)

1932 Blackmore, A., 6 Doughty Street, W.C.1. (Bot.)

1930 Blair, K. G., D.Sc., F.R.E.S., 120 Sunningfields Road, Hendon, N.W.4. (Ent.)

1933 Bomford, Miss N., 13 Theobald's Road, W.C.1. (Orn., R.)

1933 Bonus, Miss A., 28a Nevern Place, Earl's Court, S.W.5. (Orn.)

1933 Booth, H. P., B.A., 5 Snow Hill, E.C.1. (Orn.)

1933 Bowtell, J. J., 238 York Road, Southend-on-Sea, Essex.

1934 Boys, M. V., Ridgeway House, 73 Friern Lane, Friern Barnet, N.20. (Orn.)

1935 Bradshaw, G. W., 11 Elm Park Gardens, Hendon, N.W.4. (Arch.)

1932 Braithwaite, Miss D. M., 18 Warren Road, Chingford, E.4. (Orn.)

1902 Braithwaite, J. O., 18 Warren Road, Chingford, E.4. (Micr., Bot., Ent.)

1910 Braithwaite, Miss N. A., 18 Warren Road, Chingford, E.4.

1934 Brandenberger, H., May Cottage, Bounds Green Road, Bowes Park, N.11. (Orn.)

1933 Brazil, Miss F., Penby, Marshalswick Lane, St Albans, Herts. (Orn.)

1930 Brend, Wm. A., M.A., M.D., B.Sc., 14 Bolingbroke Grove, Battersea, S.W.11. (Arch., Orn., R.)

1934 Brine, C. R. T., 16 Risingholme Road, Wealdstone, Harrow, Middlesex. (Orn.)

1933 Bromley, Miss B., 45 Torrington Square, W.C.1. (Orn., R.)

1916 Brown, A., F.Z.S., 44 Ravensdale Road, Stamford Hill, N.16. (Orn., Arch., Geol., R.)

1936 Brown, E. C., M.Sc. (Lond.), 120 Durlston Road, Kingston-on-Thames, Surrey. (Bot., Ecol.)

1933 Brown, Miss M. M., 104 Edenbridge Road, Bush Hill Park, Enfield, Middlesex. (Orn., Ent., Bot.)

1926 Browne, Miss C. H., 219 Harlesden Road, N.W.10. (R., Arch., Bot.)

1930 Burgham, Miss J. E., 32 Queen's Court, Hampstead Way, N.W.11. (Orn.)

1915 Burkill, H. J., M.A., F.R.G.S., 3 Newman's Court, Cornhill, E.C.3. (Pl. G., Lep., Bot., Geol., Orn., R., Ecol.)

1933 Burton, M., M.Sc., F.Z.S., 25 Wellesley Road, Twickenham, Middlesex. (Porifera, Orn.)

1935 Butterworth, Miss M. H., Dyer's Lane, Putney, S.W.15. (Orn., Bot.)

1932 Caiger-Smith, Miss J., 23 Hornton Street, Kensington, W.8. (Orn.)

1928 *Campbell, J. M. H., M.D., 47 Arkwright Road, Hampstead, N.W.3. (Orn., R.)

1912 Capleton, A., The Hawthorns, Monkham's Drive, Woodford Green, Essex. (Mam., Orn., R., Bot.)

1926 Carr, Miss A. N., 7 Cambridge Road, Watford, Herts. (Orn., R.)

1933 Carter, J. S., Ph.D., M.Sc., F.I.C., 26 St John's Road, Golders Green, N.W.11. (Orn.)

1932 Castell, C. P., 52 Graham Road, Wimbledon, S.W.19. (Bot., Geol., Ecol.)

1930 Chandler, S. E., D.Sc., F.L.S., 59 Anerley Park, Penge, S.E.20. (Bot.)

1931 Chester, Geo., 71 Holmdene Avenue, Headstone Lane, Harrow, Middlesex. (Bot.)

1931 Chubb, Sir Lawrence, 71 Eccleston Square, S.W.1. (R.)

1927 Clanchy, Mrs B. L., Trebah, Cranbourne Drive, Pinner, Middlesex. (R., Orn.)

1927 Clanchy, D. H., Trebah, Cranbourne Drive, Pinner, Middlesex. (R., Orn., Ecol.)

1934 Clark, J. T., Five Oaks, Ninham's Wood, Farnborough, Kent. (Orn.)
1934 Clarke, Mrs M. A., 49 King's Road, Chingford, E.4. (Orn.)
1935 Clarke, Miss M. I., 178 Hoppers Road, Winchmore Hill, N.21. (Orn., Bot., Arch., R.)
1935 Clerk-Rattray, Miss E., 54 Basildon Court, Devonshire Place, W.1. (Bot., Orn.)
1929 Coates, Miss N. H., Woodhouse, Beaumont Road, Wimbledon Park, S.W.19. (Orn., Bot.)
1904 Cockayne, E. A., M.A., D.M., F.R.C.P., F.R.E.S., 116 Westbourne Terrace, Paddington, W.2. (Lep., Biol.)
1935 Cockerton, J. G., Cromdale, Marlborough Hill, Harrow, Middlesex. (Orn., R.)
1925 Cocksedge, W. C., 6 Aldersmead Road, Beckenham, Kent. (Orn., Arch., Bot., Ecol.)
1929 Cocksedge, Mrs, 6 Aldersmead Road, Beckenham, Kent. (Arch., Bot., Ecol.)
1907 Collenette, C. L., F.R.G.S., F.R.E.S., 112 The Terrace, Richmond, Surrey. (Ent., Orn., Bot., Ecol.)
1932 Collenette, Mrs C. L., 112 The Terrace, Richmond, Surrey. (Orn.)
1933 Collett, G. W., 84 Jermyn Street, S.W.1. (Orn., Ecol.)
1936 Collett, R. L., 12 Hereford Mansions, W.2. (Orn.)
1934 Collings, Mrs M., 36 Alfriston Road, Battersea, S.W.11. (Ent., R.)
1914 Connoll, Miss E., 68a High Road, S. Woodford, E.18. (Orn.)
1904 Cooke, Rev. P. H., B.A., 19 Hainthorpe Road, West Norwood, S.E.27. (Bot., Arch., Ecol.)
1934 Coon, F. A. H., 7 Grenville Mansions, Hunter Street, W.C.1. (Orn.)
1928 Cox, Miss L. E., 72 Corringham Road, Golders Green, N.W.11. (Bot.)
1929 Cranfield, Mrs V., M.B.O.U., Little Tompsetts, Forest Row, Sussex. (Orn.)
1932 Creighton, Miss M. B., 78 Highview Avenue, Edgware, Middlesex. (Bot., Biol., Pl. G.)
1931 Crook, W. M., F.R.G.S., F.Z.S., 6 St Andrew's Place, Regent's Park, N.W.1. (Orn.)
1927 Cross-Rose, F., Kenmore, 20 Woolstone Road, Forest Hill, S.E.23. (Orn.)
1892 Culpin, Millais, M.D., F.R.C.S., 12 Park Village East, N.W.1. (Biol.)
1930 Cunningham, J., M.B.O.U., 3 Donegall Square East, Belfast. (Orn.)
1892 Cyriax, R. C., 23 Aberdare Gardens, West Hampstead, N.W.6. (Arch., Aryan question, Indo-European languages.)
1936 Daffarn, J. D., 20 Woodside Avenue, Highgate, N.6. (Orn.)
1934 Dale, Miss G. R., 33 Cartwright Gardens, W.C.1. (Orn., R.)
1920 *Dallas, J. E. S., 83 Belsize Lane, Hampstead, N.W.3. (Orn., Bot., Arch., Ecol.)

1925 *Dallas, Mrs Rosa F., 83 Belsize Lane, Hampstead, N.W.3. (Arch., Bot., Geol., Orn., Ecol.)
1933 Davies, Miss E. B., Graffham, Petworth, Sussex. (Orn., Ent.)
1935 Davies, Miss R. E., 14 Purley Bury Avenue, Sanderstead, Surrey. (Bot., Orn.)
1932 Davis, Miss R., 118 College Road, Dulwich, S.E.21. (Orn., R.)
1926 Deane, Miss M. B. H., c/o Westminster Bank Ltd., Gerrards Cross, Bucks. (Orn.)
1910 Dell, F. G., 55 Russell Road, Buckhurst Hill, Essex. (P. L., Micr., Orn.)
1932 Denham, R., M.B.O.U., 12 Weymouth Court, 1 Weymouth Street, W.1. (Orn., Ent.)
1933 Doran, F. H., Toddsbrook, Gt. Parndon, Harlow, Essex. (P. L.)
1928 Douglas-Smith, Miss K., 19 Thurlow Road, Hampstead, N.W.3. (Arch., Orn., Bot.)
1927 Druce, F., M.A., F.L.S., 60 Burton Court, Chelsea, S.W.3. (Bot.)
1927 Dunkerley, Rev. C. L., M.A., M.C., Iver Heath Rectory, Iver, Bucks. (Arch., Orn.)
1934 Dunkin, W. H., 95 Park Road, West Dulwich, S.E.21. (Orn.)
1935 Dunsdon, Miss M., 7a The Parade, Carshalton, Surrey. (Orn.)
1934 Eales-White, Major J. C., T.D., F.R.E.S., F.Z.S., 88 Mount Ararat Road, Richmond, Surrey. (Orn., Ent., Arch.)
1928 Emberson, L. M., 49 Adela Avenue, West Barnes, New Malden, Surrey. (Orn., Ecol.)
1927 English, Miss F., 8 Dorville Road, Ravenscourt Park, Hammersmith, W.6. (Orn., Bot., Arch., R.)
1907 Eynon, Lewis, B.Sc., F.I.C., Fernleigh, Hall Lane, Upminster, Essex. (Chem.)
1935 Farquharson, A., Le Play House, 35 Gordon Square, W.C.1.
1936 Ferguson, Miss E., 3 Crossfield Road, Hampstead, N.W.3.
1927 Fisher, Mrs G. L., 80 Richmond Avenue, Hillingdon, Middlesex. (Arch.)
1934 Fitter, R. S. R., F.Z.S., Springfield, Ewell, Surrey. (Orn., Ecol., Ent.)
1922 Forster, W. C., 34 Nevern Square, Earls Court, S.W.5. (Arch., R.)
1924 Foster, J. B., B.A., 12 Conway Road, Wimbledon, S.W.20. (Orn.)
1935 Foster, Mrs J. B., 12 Conway Road, Wimbledon, S.W.20.
1928 Fox, G. J. B., 45 Stanwick Mansions, West Kensington, W.14. (Arch.)
1932 Franklin, A. W. L., 16 Airlie Gardens, Campden Hill, W.8. (Orn.)
1931 Frederick, Miss L. M., M.Sc., F.Z.S., Whitelands College, West Hill, Putney, S.W.15. (Orn., P. L., Ecol.)
1935 French, W. A., Hill Cottage, Loughton, Essex. (Orn., Bot.)
1931 Frohawk, F. W., M.B.O.U., F.R.E.S., Essendene, Cavendish Road, Sutton, Surrey. (Orn., Ent.)
1920 Gamble, Rev. H. J., M.A., 14 Frederica Road, Chingford, E.4. (Arch., Conch.)

1936 Gardner, D. H. W., Merchant Taylors' School, Sandy Lodge, Northwood, Middlesex. (Orn.)

1932 Garrido, A. S., 102 Clonmell Road, Tottenham, N.17. (Bot.)

1933 Gaster, H., 26a Lunham Road, Upper Norwood, S.E.19. (Bot., Orn.)

1934 Gawthorne, A. H., 29 Nicoll Road, Harlesden, N.W.10.

1910 Gaze, W. E., 10 The Avenue, Highams Park, Chingford, E.4. (Lep., Bot., Chem.)

1909 Gerrard, V. L. G., Dunster House, Mincing Lane, E.C.3. (Lep.)

1934 Gibson, Miss J., 7 Pembridge Square, W.2. (Orn.)

1931 Gillett, J. D., F.R.E.S., 1 Beulah Road, Walthamstow, E.17. (Ent., Rept.)

1933 Gillham, E. H., Dilkusta, Coulsdon Road, Old Coulsdon, Surrey. (Orn.)

1910 Glegg, W. E., F.Z.S., M.B.O.U., 2 Burlington House, King's Road, Richmond, Surrey. (Orn.)

1934 Godwin, C., 11 Compton Terrace, N.1. (Orn.)

1934 Godwin, Mrs M. L., 11 Compton Terrace, N.1. (Orn.)

1929 Goodfellow, Miss L., Flat 3, 28 John Street, Gray's Inn, W.C.1. (Orn.)

1930 Goodwin-Vanner, R. E., F.R.S.A., F.R.H.S., Essex Villa, Guildford, Surrey. (Arch.)

1934 Gray, Miss J. W., 10 Canford Road, Clapham Common, S.W.11. (R., Bot.)

1927 Green, Roland, F.Z.S., Ruskin Studio, 7 New Court, Lincoln's Inn, W.C.2. (Orn.)

1936 Greenwell, W. N., 1 Petersham Road, Petersham, Surrey. (Orn.)

1899 *Greenwood, Prof. M., D.Sc., F.R.S., F.R.C.P., Hillcrest, Church Hill, Loughton, Essex. (Arch., Biol.)

1928 Griffin, Miss M., 22 Addison Way, Golders Green, N.W.11. (Orn.)

1920 Grinling, C. H., B.A., 71 Rectory Place, Woolwich, S.E.18. (Bot.)

1929 Gulliver, Miss M. D., 84 Endsleigh Gardens, Ilford, Essex. (Orn.)

1933 Gunton, L., Lahlglyn, Cross Path, Radlett, Herts. (Orn.)

1932 Hadfield, J., Denecroft, Heath Way, Effingham, Surrey. (Orn.)

1926 Hadfield, Mrs M. H., Denecroft, Heath Way, Effingham, Surrey. (Orn., Bot., R.)

1927 Hale, R. W., 6 Grendon Gardens, Barn Hill, Wembley Park, Middlesex. (Orn.)

1936 Hall, J. B., Nakuru, Bridle Lane, Loudwater, Rickmansworth, Herts. (Orn.)

1903 Hanbury, F. Capel, Westfield, Hoddesdon, Herts. (Lep.)

1906 Hanbury, Frederick J., F.L.S., F.R.E.S., Brockhurst, East Grinstead, Sussex. (Bot., Lep.)

1897 *Hanson, P. J., Burcroft, Village Road, Bush Hill Park, Enfield, Middlesex. (Orn., Arch.)

1927 Hardiman, Miss A., Hyron's Cottage, Woodside Lane, Amersham, Bucks. (R.)

1921 Hardiman, J. B., C.B.E., B.A., Hyron's Cottage, Woodside Lane, Amersham, Bucks. (Orn., R.)

1935 Harris, A. H., Silton, The Green, Ewell, Surrey. (Orn.)
1935 Hatch, R. S., 66 Coston's Avenue, Greenford, Middlesex. (Orn.)
1930 Haworth, Miss F. M., B.Sc., F.Z.S., 9 Carmalt Gardens, Putney, S.W.15. (Zoo., Bot.)
1927 Hayward, Jno. F., B.Sc., 17 Heathcote Grove, Chingford, E.4. (Geol., Zoo.)
1935 Hearn, Miss D. B., 56 Meadvale Road, Ealing, W.5. (Orn., Bot., Arch., R.)
1933 Hearn, Miss K. L., 56 Meadvale Road, Ealing, W.5. (Orn., R.)
1902 Heath, G. H., M.A., 3 Bolney Court, Portsmouth Road, Surbiton, Surrey. (Lep.)
1935 Henderson, Miss F. E., 35 Ladbroke Gardens, Notting Hill, W.11. (Orn.)
1934 Henderson, G. A., 12 Chepstow Crescent, Notting Hill, W.11. (Orn.)
1930 Hick, A. E., 68 Brockswood Lane, Welwyn Garden City, Herts.
1932 Higgins, T. T., F.R.C.S., 34 Harley Street, W.1. (Orn., Ent.)
1936 Hilliard, R., The Moorings, 5 Oakleigh Gardens, Edgware, Middlesex. (Ent.)
1932 Homes, R. C., 170 Manor Green Road, Epsom, Surrey. (Orn., R., Ecol.)
1930 Hopkins, Graham, Bourne Cottage, Duck's Hill Road, Northwood, Middlesex. (Orn., Ecol.)
1919 Horn, P. W., Stepney Borough Museum, 77 Whitechapel High Street, E.1. (Orn., Aqua.)
1905 Hornblower, A. B., 91 Queen's Road, Buckhurst Hill, Essex. (Api., Arch., Orn., R., Ecol.)
1931 *Hose, Miss M. M., 22 The Avenue, Bickley, Kent. (Orn., Bot., Ent., Pl. G., Ecol.)
1935 Hosegood, Miss H. B., Lynton Lodge, Dingwall Road, Croydon, Surrey. (Orn.)
1933 House, F. C., 3a Chalcot Gardens, England's Lane, N.W.3. (Orn., R.)
1910 Howard, D. Lloyd, J.P., F.I.C., F.C.S., Pettits Hall, Chigwell, Essex. (Chem.)
1936 Hunt, Miss C. D. F., 52 St Helen's Gardens, North Kensington, W.10. (Arch., Bot., Geol., Orn.)
1930 Hutton, Miss R. E., 34 Thorneyhedge Road, Gunnersbury, W.4. (Bot., Zoo.)
1935 Hyde, J. H., 52 Tangier Road, Richmond, Surrey. (Orn., Bot.)
1934 Jackson, Miss N., 43 Casselden Road, Harlesden, N.W.10. (Biol.)
1927 Jeffery, H. J., A.R.C.S., F.L.S., 14 Coppetts Road, Muswell Hill, N.10. (Bot.)
1926 Jehan, Kenneth C., King's Arms Hotel, Amersham, Bucks. (Bot., Arch.)
1929 Johns, Miss F. E., 40 The Ridgeway, Kenton, Harrow, Middlesex. (Orn., R., Bot.)
1933 Johns, Miss L. J., 87 Morley Hill, Enfield, Middlesex. (Arch., Bot., Orn., R., Ecol.)

1931 Johnston, F. J., 19 Connaught Avenue, Chingford, E.4. (Orn.)
1932 Jones, Rodney R. M., Tros-yr-Afon, Penmon, Anglesey. (Orn.)
1932 Joy, N. H., M.R.C.S., L.R.C.P., M.B.O.U., F.R.E.S., 271 Kilburn Lane, North Kensington, W.10. (Orn., Col.)
1899 *Kaye, W. J., F.R.E.S., Chantrey Lodge, Longdown, Guildford, Surrey. (Lep.)
1936 Kenworthy, Miss K. M., 45 Palace Court, W.2. (Arch., Bot., Orn.)
1934 Kerr, Mrs H. M. Rait-, 23 Lambolle Road, Hampstead, N.W.3. (Orn., Arch.)
1930 King, Miss C. A., M.D., 152 Harley Street, W.1. (Orn., Arch.)
1929 King, E. L., Holkham, 11 Downs View, Isleworth, Middlesex. (Orn., Bot., R.)
1932 King, Mrs E. L., 11 Downs View, Isleworth, Middlesex. (Orn., Bot., R.)
1932 Kirkness, Miss D. S., F.Z.S., 6 Mill Lane, West Hampstead, N.W.6. (Zoo., Bot., Arch.)
1931 Lack, C., 31 Marlborough Place, St John's Wood, N.W.8. (Orn.)
1928 Lack, H. L., M.D., F.R.C.S., 31 Marlborough Place, St John's Wood, N.W.8. (Orn.)
1936 Lamont, Mrs E. H., 49a Netherhall Gardens, Hampstead, N.W.3. (Orn.)
1927 Lane, J. H., 571/3 Commercial Road, E.1. (Chem.)
1932 La Touche, J. N. Digues, M.Inst.C.E., Woodcroft, Baldwin's Hill, Loughton, Essex.
1932 Le Cocq, L., 17 Highbury Hill, N.5. (R., Orn.)
1930 Ledlie, R. C. B., M.B., B.Sc., F.R.C.S., 64 Harley Street, W.1. (Bot.)
1928 Lee, Miss M., 22 Addison Way, Golders Green, N.W.11. (Orn.)
1928 Leech, T., 33 First Avenue, Bush Hill Park, Enfield, Middlesex. (Bot., Orn.)
1933 Leith, R. F., Beaumont, Amersham, Bucks. (Orn., Arch.)
1922 Lemon, Mrs M. L., M.B.E., J.P., F.Z.S., M.B.O.U., Hillcrest, Redhill, Surrey. (Orn.)
1936 Lewis, Miss M., Oaklea, Whitehall Lane, Buckhurst Hill, Essex. (Orn., Bot., Ent., R., Arch.)
1919 Leyton Public Libraries, per the Librarian (E. Sydney, F.L.A.), Central Library, Leyton, E.10.
1927 Lister, Miss G., F.L.S., 871 High Road, Leytonstone, E.11. (Orn., Bot.)
1926 *Littlejohn, H. A., 20 Trinity Road, Barkingside, Ilford, Essex. (Orn., Bot.)
1934 Locket, G. H., M.A., M.Sc., West Hill House, Harrow, Middlesex. (Ent., Ecol.)
1933 Lockyer, T. Norman, LL.B. (Lond.), 12 Wimborne Gardens, West Ealing, W.13. (Arch., Orn., R.)
1926 *Longfield, Miss C. E., F.R.G.S., F.R.E.S., F.Z.S., M.B.O.U., 20 Pont Street, S.W.1. (Orn., Ent., Bot., Ecol.)
1930 *Low, G. Carmichael, M.A., M.D., F.R.C.P., F.Z.S., M.B.O.U., 86 Brook Street, Grosvenor Square, W.1. (Orn., Zoo.)

1928 MacAlister, Mrs E., 10 St Alban's Road, Kensington, W.8. (Orn., Bot.)

1935 McCulloch, G. K., 65 Chester Road, Northwood, Middlesex. (Orn.)

1933 MacDonald, Right Honourable Malcolm J., P.C., M.P., Lossiemouth, Morayshire, N.B. (Orn.)

1935 McDowell, Miss C. M., 43 Montague Road, Richmond, Surrey. (Bot., Orn.)

1932 McInnes, Miss J., 3 The Close, Carshalton Beeches, Surrey. (Orn., Bot.)

1911 MacIntosh, Miss I. S., 3 Mayfield Road, Chingford, E.4. (Bot.)

1911 MacIntosh, Miss J. D., 3 Mayfield Road, Chingford, E.4. (Bot.)

1929 Mackay, Helen M. M., M.D., F.R.C.P., 28 John Street, Bedford Row, W.C.1. (Orn.)

1931 McKittrick, Thos. H., Jun., M.B.O.U., Coombe Place, East Grinstead, Sussex. (Orn.)

1932 McKittrick, Mrs T. H., Jun., Coombe Place, East Grinstead, Sussex. (Orn.)

1932 Mackworth-Praed, C. W., F.R.G.S., F.Z.S., F.R.E.S., M.B.O.U., 51 Onslow Gardens, South Kensington, S.W.7. (Orn., Ent.)

1923 *Macpherson, A. Holte, B.C.L., M.A., F.Z.S., 21 Campden Hill Square, W.8. (Orn.)

1932 Macqueen, Miss R. W. E., 252 Camden Road, N.W.1. (Arch., Orn., R.)

1929 Maltby, Miss J., Duncliffe, 157 Copers Cope Road, Beckenham, Kent. (Orn., Bot., P. L.)

1923 Mann, E., 10 Frankland Road, S. Chingford, E.4. (P. L., Orn., Ecol.)

1934 Mann, F. R., M.C., Noreena, Ham Common, Surrey. (Orn.)

1934 Manser, G. E., 51 Barnmead Road, Beckenham, Kent. (Orn., Bot., Ecol.)

1934 *Marchant, Miss R., 76 Witley Court, Woburn Place, W.C.1. (Bot., Arch.)

1929 Marshall, John G., Rye House, Green Lane, New Eltham, S.E.9. (Orn.)

1932 Mason, C. T., 34 East Lane, Wembley, Middlesex. (Ent., Arch.)

1933 Maund, Miss A. N., 32 Chardmore Road, Stoke Newington, N.16. (Orn.)

1935 Melluish, W. D., 56 Sunnyfield, Mill Hill, N.W.7. (Orn.)

1931 Millburn, Miss F. C., 62 Herne Hill, S.E.24. (Orn.)

1926 Mitchell, Miss E. A., 52 Parkfield Road, S. Harrow, Middlesex. (Bot.)

1932 Mitchell, Miss M. I., 26 Burlington Road, Osterley, Middlesex. (Bot., Orn.)

1934 Moore, F., 122 Sloane Street, S.W.1. (Arch.)

1934 Morgan, D. A. T., 38 Heath Hurst Road, Hampstead, N.W.3. (Orn., R., Ecol.)

1935 Morris, K. R. S., Ph.D., Farnham House Laboratory, Farnham Royal, near Slough, Bucks. (Ent., Orn., Ecol.)

1934 Munro, Miss M., Furzedown Training College, Welham Road, Tooting, S.W.17. (Orn.)

1928 Murphy, Miss H., 43 Stafford Row, Bow, E.3. (Bot., Orn., Ent., Arch.)

1934 Newcombe, Miss P. M., 52 Northway, Golders Green, N.W.11. (Orn., Bot., R.)

1926 Niblett, Montague, 10 Greenway, Wallington, Surrey. (Ent., Pl. G.)

1893 *Nicholson, Miss B., Rotherwood, 49 Danecourt Road, Parkstone, Dorset. (Bot.)

1934 Nicholson, E. M., M.B.O.U., 61 Marsham Street, S.W.1. (Orn., Ecol.)

1934 Nicholson, E. T., 321 Brettenham Road, Walthamstow, E.17. (Orn.)

1932 Nicholson, G., Homeland, Basildon Road, Laindon, Essex. (Orn.)

1928 Noel, Miss E. F., 37 Burnham Court, W.2. (Bot., Orn., R., Ent., Pl. G.)

1934 Norris, C. A., 15 Hazlewell Road, Putney, S.W.15. (Orn., Ecol.)

1933 Oke, E. E., Tweenways, The Mount, Leatherhead, Surrey. (Orn., Ent.)

1926 *Oldham, Charles, F.L.S., F.Z.S., M.B.O.U., The Bollin, Shrublands Road, Berkhamsted, Herts. (Bot., Orn., Conch., Ecol.)

1929 Page, Miss M. M., 19 Hainthorpe Road, West Norwood, S.E.27. (Orn.)

1924 Palmer, Miss Fanny, 8 Ulundi Road, Blackheath, S.E.3. (Arch.)

1925 *Parmenter, L., 94 Fairlands Avenue, Thornton Heath, Surrey. (Ecol., Bot., Ent. (esp. Dipt.), Orn., Pl. G.)

1921 Parsons, S. T. T., 89 Holland Park, Notting Hill, W.11. (Orn.)

1933 Paulson, C. W. G., M.B.O.U., 3 Belsize Grove, Hampstead, N.W.3. (Orn.)

1922 Payne, C. H., 13 Kidderpore Gardens, Hampstead, N.W.3. (Orn., Arch.)

1930 Payne, E. D. B., 32 Friern Watch Avenue, North Finchley, N.12. (Orn.)

1923 Payne, E. M., Tilgate, Long Lane, Hillingdon, Middlesex. (Bot., Orn.)

1923 Payne, L. G., 22 Marksbury Avenue, Richmond, Surrey. (Bot., Ecol.)

1935 Pearce, B. S. K., 74 Ashgrove Road, Goodmayes, Ilford, Essex, (Orn., Bot., Ent.)

1935 Pearse, Miss E., 21 Ruskin Walk, Herne Hill, S.E.24. (Bot., Orn.)

1934 Pearson, Miss D. M., St Gabriel's College, Cormont Road, Camberwell, S.E.5. (Orn., P. L., Bot., Pl. G.)

1932 Pedler, E. G., 76 Queen's Gate, S. Kensington, S.W.7. (Orn.)

1922 Pethen, R. W., 108 Northwold Road, Upper Clapton, E.5. (Orn., Ent., Ecol.)

1931 Pethen, Miss Rita W., 108 Northwold Road, Upper Clapton, E.5. (Orn., Rept.)

1929 Phelan, T. C. E., Sarum, St Andrews Road, Coulsdon, Surrey. (Orn., Bot.)
1932 Phillips, Mrs F. M., 9 Sylvan Hill, Upper Norwood, S.E.19. (Orn.)
1932 Phillips, H. H., M.R.C.S., L.R.C.P., 9 Sylvan Hill, Upper Norwood, S.E.19. (Orn.)
1933 Ping, Miss M. L., 47 Willifield Way, Hampstead Garden Suburb, N.W.11. (Orn., Bot.)
1931 Pinniger, E. B., 19 Endlebury Road, Chingford, E.4. (Ent., Orn.)
1927 Piper, Miss G. E. M., 12 Elms Road, Clapham, S.W.4. (Orn.)
1925 Poock, S. G., 17 Green Moor Link, Winchmore Hill, N.21. (Orn.)
1928 Poole, A. C., 42 The Mall, Ealing, W.5. (Orn., Bot.)
1933 Popple, Miss W. N., 11 Pemberton Gardens, Upper Holloway, N.19. (Orn., R., P. L.)
1910 Pratt, W. B., 10 Lion Gate Gardens, Richmond, Surrey. (Lep.)
1892 Prout, L. B., F.R.E.S., 84 Albert Road, Dalston, E.8. (Lep., Biol.)
1929 Pugh, Miss E. C., The Hill Farm, Stockbury, Kent. (Orn.)
1929 Purey-Cust, Miss Peggy, 49 West Hill, Highgate, N.6.
1927 Raikes, Miss D., 24 Launceston Place, Kensington, W.8. (Arch., Bot., Orn.)
1926 Rankin, The Hon. Lady, Royal Court Hotel, Sloane Square, S.W.1. (Orn.)
1934 Ratcliff, P. W., 12 Barnmead Road, Beckenham, Kent. (Orn., Bot.)
1934 *Ray, Miss T., 76 Witley Court, Woburn Place, W.C.1. (Bot., Arch.)
1936 Redgrave, G., 57 Ranelagh Gardens Mansions, Hurlingham, S.W.6. (Orn., R.)
1935 Redpath, K., Glanton, Manor Road, Hazlemere, High Wycombe, Bucks. (Orn.)
1929 Reed, Miss J. B., 29 Thornton Hill, Wimbledon, S.W.19. (Orn.)
1930 Reeve, Miss E. A., The Penn Club, 9 Tavistock Square, W.C.1. (Bot., Orn., Ent., R.)
1929 Rew, Miss M., 23 Chester Terrace, Regents Park, N.W.1. (Orn.)
1925 Richardson, Arthur, Iona, London Colney, Herts. (Orn., Ent.)
1928 Richardson, G., 74 Tulse Hill, Brixton, S.W.2. (Bot.)
1892 Robbins, R. W., Bullens Lee, Pains Hill, Limpsfield, Surrey. (Bot., Lep., Orn., Arch., Pl. G., Ecol.)
1934 Roberts, J. E., B.Sc., Fairhaven, Bond Road, Surbiton, Surrey. (Orn., Ecol.)
1933 Robinson, G. F. B., Shenley, Manor Green Road, Epsom, Surrey. (Orn.)
1933 Robinson, Mrs M. L., Shenley, Manor Green Road, Epsom, Surrey. (Bot., R.)
1936 Rogers, Miss P. M. M., Oaklea, Whitehall Lane, Buckhurst Hill, Essex. (Orn., Bot., Ent., R., Arch.)
1932 Rosevear, D. R., Conservator of Forests, Benin City, Nigeria. (Ent., Bot.)

1910 *Ross, J., 23 College Gardens, Chingford, E.4. (Bot., Pl. G., Orn., Ecol.)
1932 Rotter, Miss G. H., Penmon, 2 Park Hill Road, Sidcup, Kent. (Bot., Arch.)
1935 Rowan, J. D., 65 Haydn Avenue, Purley, Surrey. (Orn.)
1931 Rowberry, E. C., 7 Burlington Road, Osterley, Middlesex. (Orn., Ecol.)
1933 Rush, Miss M. M., 22 Hill Rise, Hampstead Garden Suburb, N.W.11. (Orn., Bot., R.)
1932 Ryan, A. P., 19 Barnsall Street, Chelsea, S.W.3. (Orn.)
1929 Sampson, E. S., 60 Alexandra Road, Epsom, Surrey. (Orn.)
1935 Sandeman, P. W., 2 Barkston Gardens, Earl's Court, S.W.5. (Orn.)
1930 Scudamore, Miss M., 23 Marchmont Road, Richmond Hill, Surrey.
1932 Seton, Sir Malcolm C. C., K.C.B., M.B.O.U., 26 Upper Park Road, Hampstead, N.W.3. (Orn.)
1935 Shill, W. A., 41 Douglas Avenue, Walthamstow, E.17. (Bot.)
1929 Short, G. R. A., 36 Parkside Drive, Edgware, Middlesex. (Bot., Micr., Pharmacognosy, Ecol.)
1936 Silva, Miss A. M. T., Stone Street Farm, near Sevenoaks, Kent. (Orn.)
1892 Simes, J. A., O.B.E., F.R.E.S., Kingsley Cottage, Queen's Road, Loughton, Essex. (Ent.)
1911 Simpson, W., M.B., B.S., D.P.H., The Ivies, 3 Adelaide Road, Andover, Hants. (Arch., Bot., Lep., Pl. G., R.)
1934 Skilton, H. W., 9 Stillness Road, Forest Hill, S.E.23. (Orn.)
1933 Skrimshire, Miss E. F., 27 Talbot Road, Highgate, N.6. (Arch., R.)
1933 Skrimshire, E. H. N., F.R.A.I., F.Z.S., 5 Old Well House, The Grove, Highgate, N.6. (Orn., Arch., R.)
1892 Smith, A. C., F.R.E.S., 18 Mornington Road, Woodford Green, Essex. (Ent.)
1935 Smith, Miss A. J., 26 Newman Street, W.1. (Orn.)
1892 Smith, C. B., F.R.E.S., 103 Wood Vale, N.10. (Lep.)
1929 Smith, Mrs H. K., 103 Wood Vale, N.10.
1936 Smith, Miss J., 15 Thornlaw Road, West Norwood, S.E.27. (Orn.)
1933 Smith, Miss L., 17 Highcliffe Gardens, Ilford, Essex. (Arch.)
1934 Smith, R. McKenzie, 124 King's Avenue, Woodford Green, Essex. (Orn.)
1927 Solly, Miss B. N., 12 Moreton Gardens, Old Brompton Road, Earl's Court, S.W.5. (Orn.)
1927 Southern, H. N., 67 Holden Road, North Finchley, N.12. (Orn.)
1935 Spinney, G. H., B.A., 4 Overhill Gardens, East Dulwich, S.E.22. (Bot., Arch., Ecol.)
1922 Spooner, Herman, 21 Musgrave Crescent, Walham Green, S.W.6. (Bot., Orn., Arch., R., Ecol.)
1936 Springall, R. S., 30 Connaught Avenue, Chingford, E.4. (Orn.)
1935 Stanyon, P., 86 Danesbury Road, Feltham, Middlesex. (Orn.)

1934 Statham, Miss M. R., The Willesden General Hospital, N.W.1. (Arch., R.)
1934 Steel, W. O., 16 Upsdell Avenue, Palmers Green, N.13. (Ent., Pl. G.)
1936 Stephens, H. S., 29 Yale Court, Hampstead, N.W.6.
1931 Story, P., 8 Alvanley Gardens, Kilburn, N.W.6. (Orn.)
1920 *Stowell, H. S., L.R.I.B.A., Pirbright, Torland Road, Hartley, Plymouth. (Arch.)
1933 Sulman, J. E., Crofters, Pine Grove, Totteridge, Herts. (Orn.)
1927 Swain, A. M., Ledburn, Crescent Drive, Petts Wood, Orpington, Kent. (Orn.)
1930 Swayne, F. G., M.A. (Cantab.), M.B., M.B.O.U., Beulah Spa Hotel, Norwood, S.E.19. (Orn.)
1935 Tams, W. H. T., F.R.E.S., British Museum (Natural History), Cromwell Road, S.W.7. (Ent.)
1930 Tassart, Miss O. F., 36 Alfriston Road, Clapham Common, S.W.11. (Arch., Orn.)
1920 Thomas, Mrs G. E., 9 Talbot Road, Isleworth, Middlesex. (Orn., R.)
1935 Thompson, Miss F., Ludbrook, Green Lanes, Winchmore Hill, N.21. (Arch., R.)
1927 Thresher, Miss G. A., 34 Henrietta Street, W.C.2. (Arch., Bot., Ent., Pl. G., R.)
1932 Todd, Miss G. E., 17 Queensborough Terrace, W.2. (Bot., Orn.)
1932 Tomlinson, A. E., Gwynant, Sutherland Avenue, Orpington, Kent. (Orn.)
1934 Tours, H., 7 Briar Road, Kenton, Middlesex.
1931 Tours, H. J., 8 Harvard Road, Gunnersbury, W.4.
1892 Tremayne, L. J., F.Z.S., Grand Buildings, Trafalgar Square, W.C.2. (Bot., Lep., Arch., Pl. G., Orn., R.)
1908 Tremayne, Mrs, Grand Buildings, Trafalgar Square, W.C.2. (Orn., Arch., Bot., R.)
1923 Trench, R. H., Hall Barn Cottage, Beaconsfield, Bucks. (Orn., R.)
1935 Turnham, R., 10 Salisbury Road, Dalston, E.8. (Orn.)
1933 Underhill, D. G., Broadway, Landscape Road, Warlingham, Surrey. (Ent.)
1931 Underwood, R. A., Avila, Eskdale Avenue, Chesham, Bucks. (Orn.)
1935 van Oostveen, Miss M., 11 Gloucester Walk, Campden Hill, W.8. (Orn., Ent.)
1927 Veitch, Miss A., 79 Shirley Gardens, Faircross, Barking, Essex. (Arch.)
1929 Venour, Miss D., 20 Burdenshott Avenue, Richmond, Surrey. (Orn.)
1933 Vincent, W. G., 154 Winchester Road, Hale End, E.4. (Orn.)
1927 Waller, G., 88 Beckenham Road, Beckenham, Kent. (Orn., Ent.)
1931 Wallis, Miss P. I., 59 East Sheen Avenue, East Sheen, S.W.14. (Orn., Ecol.)

1925 Ward, Bernard T., 24 Long Deacon Road, Chingford, E.4. (Arch., Bot., Ent., Orn., Pl. G., R., Ecol.)

1933 Ward, Miss I. W., 11 The Close, Old Southgate, N.14. (Orn., Icht.)

1933 Ward, Margaret, M.B., Ch.B., Threeways, Jordans, Beaconsfield, Bucks. (Arch., Orn.)

1920 Watkins, Miss H., 12 Connaught Avenue, East Sheen, S.W.14. (Orn., R., Bot.)

1936 Watt, E. C., 13 Park Road, N.W.1. (Orn.)

1926 Watt, Hugh Boyd, F.Z.S., 90 Parliament Hill Mansions, Lissenden Gardens, N.W.5. (Orn., Ecol., Zoo., Bot.)

1925 *Watt, Mrs Winifred Boyd, M.B.O.U., 90 Parliament Hill Mansions, Lissenden Gardens, N.W.5. (Orn., Arch.)

1932 Wattson, Miss C. M., Fairholt, Oakleigh Avenue, Whetstone, N.20. (Orn., Ent.)

1893 Wattson, R. Marshman, 33 Gerard Road, Harrow, Middlesex. (Arch., Ent.)

1928 Weeks, Claude, 7 Ashmount Road, Highgate, N.19. (Orn., Ecol., R.)

1931 Wheeler, Miss E. M., 28 Hardy Road, Blackheath, S.E.3. (Orn., Bot., Ecol.)

1929 Wheeler, E. P., F.R.I.B.A., Park Lodge, Park Road, Sutton, Surrey. (Orn., Arch.)

1935 Whitaker, F. O., 51 Grosvenor Avenue, Carshalton, Surrey. (Bot., Pl. G., R., Ecol.)

1930 Whitbread, R., 6 Meadow Way, Weald Village, Harrow, Middlesex. (Arch.)

1932 Whitbread, Miss W. H. E., 6 Meadow Way, Weald Village, Harrow, Middlesex.

1933 White, E. I., Ph.D., F.G.S., Dept. of Geology, British Museum (Natural History), S. Kensington, S.W.7. (Palaeontology, Orn.)

1935 Whitehouse, F. W., Wayside East, Oak Road, Harold Wood, Essex. (Bot.)

1934 Wightman, J. S., Wood View, Park Road, Ashtead, Surrey. (Orn.)

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1933 Williams, T. Lloyd, M.A., 6 Howden Road, South Norwood Hill, S.E.25.

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1936 Wilson, J. M., Redwing, Townsend Drive, St Albans, Herts. (Orn.)

1931 Wing, J. S., 21 Cheyne Gardens, Chelsea, S.W.3. (Orn.)

1929 Witherby, H. F., M.B.E., H.F.A.O.U., F.Z.S., M.B.O.U., 12 Chesterford Gardens, Hampstead, N.W.3. (Orn.)

1935 Woods, Miss C. E. L., Little Ballards, Farley Road, South Croydon, Surrey. (Orn., Ent., Zoo.)

1922 Wright, W. A., 31 Beresford Road, Chingford, E.4. (Orn.)

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1932 Charles, Capt. R., Riplingham, The Circle, Clarendon Road, Southsea, Hants. (Marine Biol.)

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1934 Elton, Rt. Hon. Lord, Greenways, Manor Road, Old Headington, Oxford. (Orn., Arch., Bot.)

1934 Elton, Lady, Greenways, Manor Road, Old Headington, Oxford. (Orn., Arch., Bot.)

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1927 Harvey, F. B., The Nook, Rhodes Minnis, Elham, nr. Canterbury, Kent.

1927 Harvey, J. H., Half Moon Cottage, Preston Cross, Little Bookham, Surrey. (Bot.)

1926 Hibbert-Ware, Miss A., F.L.S., M.B.O.U., Hilary, Girton, Cambridge. (Orn.)

1931 Hine, Mrs S. McDougall, Mayfield, Meopham, Kent. (Orn.)

1915 Hopkins, Prof. Sir F. Gowland, O.M., M.A., M.D., F.R.S., F.R.C.P., 71 Grange Road, Cambridge. (Biochemistry.)

1934 Johnston, J. Hope, Sidney Sussex College, Cambridge. (Orn., Ent.)

1931 Kent, Mrs J. Barton, Sea Spray, Selsey on Sea, Sussex. (Arch.)

1935 Leatherdale, D., Tasli, Hawks Hill, Leatherhead, Surrey. (Geol., Bot., Ent., Pl. G., R.)

1934 Mackenzie, P. Z., 8 The Grove, Highgate, N.6 (Orn.)

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1931 Maud, Mrs F. H., St Catherine's, Wind Hill, Bishop's Stortford, Herts. (Arch.)
1927 Mellows, C., M.A., F.R.E.S., Alliott House, Bishop's Stortford College, Bishop's Stortford, Herts. (Bot., Ent.)
1902 Miller, Miss E., The Croft, Rainsford Lane, Chelmsford, Essex. (Lep.)
1905 Moore, J. W., F.R.E.S., Middleton Dene, 151 Middleton Hall Road, King's Norton, Birmingham. (Exotic Lep.)
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1931 Spittle, R. J., Alaska, Farnham Road, Farnham Royal, Slough, Bucks. (Col., Orn., Ecol.)
1914 Studd, E. F., M.A., B.C.L., F.R.E.S., Exeleigh, Starcross, Devon. (Lep.)
1928 Talbot, G., F.R.E.S., Mon Plaisir, Wormley, Surrey. (Lep.)
1934 Thomson, W. W., 2 View Road, Highgate, N.6. (Orn.)
1935 Tracy, N., The Black Cabin, South Wootton, King's Lynn, Norfolk. (Orn.)
1924 Welch, R. J., M.Sc., M.R.I.A., 49 Lonsdale Street, Belfast.
1913 Wilde, Mrs C. L., Lindfield, Marshall Road, Godalming, Surrey. (Arch., Bot., Pl. G.)
1929 Willcox, P. H., Emmanuel College, Cambridge. (Ent., Bot.)
1932 Williams, A. R., Barclay's Bank (D.C. & O.), Haifa, Palestine. (Orn.)

NOTE.—The following abbreviations are used in the above lists:—Api., Apiculture; Aqua., Aquaria; Arch., Archaeology; Ast., Astronomy; Biol., Biology; Bot., Botany; Chem., Chemistry; Col., Coleoptera; Conch., Conchology; Dipt., Diptera; Ecol., Ecology; Ent., Entomology; Ethn., Ethnology; Geol., Geology; Hem., Hemiptera; Hym., Hymenoptera; Icht., Ichthyology; Lep., Lepidoptera; Mam., Mammalogy; Micr., Microscopy; Neur., Neuroptera; Orn., Ornithology; Orth., Orthoptera; Ool., Oology; Pl. G., Plant Galls; P. L., Pond Life; R., Ramblers' Section; Rep., Reptilia; Zoo., Zoology.

*Signifies a Life Member.

The Naturalist in the Laboratory.

By Prof. Sir F. Gowland Hopkins, O.M., M.A., M.D., F.R.C.P., P.R.S.

I WOULD like first to acknowledge the high honour the London Natural History Society has done me by choosing me as its Honorary President. Doubtless owing to my own fault, this is the first opportunity I have had of expressing verbally the gratitude I feel for the honour thus done me.

In following so distinguished a predecessor as Lord Grey of Fallodon I cannot fail to realise the dignity of the office, and I am proud to know that the Society should think me worthy to hold it. I would like to say further that I appreciate the catholicity displayed in the Society's choice of a laboratory worker for that office, and especially perhaps of a biochemist, whose activities might seem remote from the interests of a Natural History Society.

Most of your members in their approach to the problems of Nature have, I imagine, followed paths very different from these which Fate of late years has allotted to me. Many, and I suppose the majority, devote themselves to the study of plants and animals when these are truly themselves; when they are displaying in freedom the behaviour which expresses their innate qualities, influenced by and reacting to their proper environment. These, I feel, may well claim to be the true Naturalists.

Many others among you are concerned with the closer study of Form; with the meaning and history of the infinite variety of forms in which life is displayed. For this all-important study the activities of the collector are essential and the resources of our Museums with the knowledge of their Staff specialists are indispensable. We cannot deny the title of Naturalists to those who follow this path to knowledge. They study organisms in their integrity.

Nor would the title be denied by most to the morphologist, though he may study the organism when in parts as well as when whole, or again to the physiologist, though he too may, on occasions at least, disintegrate the organism in the endeavour to solve his special problems. But can you allow the title to the biochemist who, imbued with what Ruskin would have called a morbid curiosity concerning mere mechanism, may seem to forget, for a time at least, the significance of Form and even the relation of Form to visible functioning. His excuse, of course, is that he would fain ascertain the nature of materials which underlie, and may even determine, differences in form, and further strives to obtain a mental picture of that invisible dance and transformation of molecules which in every organ or tissue underlies its visible activities. In such attempts he deals with the organism not only disintegrated into its parts but often with those parts dissolved in fluid media. Is he not then too far removed from Nature to be a Naturalist? I hope you do not think so, for I covet the title!

I remember many years ago watching side by side with an accomplished lepidopterist the alternate darting and hovering of a Humming-bird Hawk Moth, and I remarked, "What marvellous little engines those wing muscles must be. How one would like to know how they work." "And do you hope," said my friend, who worshipped the beauty of the display (and to this I may claim I was by no means indifferent), "do you hope to learn this with pestle and mortar and test tube?" I understood his feelings, but I am presently going to claim that the biochemist during the years that have since elapsed has made some progress at least towards an understanding of how those highly efficient motors burn their fuel.

I take pride in the biochemist's progress in such directions, yet in speaking to a Natural History Society I almost feel that I should apologise for the destructive habits of his kind. But if my cursory and little prepared remarks can be said to have a purpose, it is to ask you to admit that all of us who find an abiding interest in the multitudinous manifestations of life are Naturalists under our skins. We must all bear our specialised labels, but under that pleasing old designation we may all find a place.

I would like straightway to express my convictions that biological science for its progress has yet need of service from competent workers of all kinds. I do not sympathise with the view which is sometimes met to-day that descriptive work in biology has had its day and that the experimentalist is now the only progressive worker. The field observer, the skilled collector, and the taxonomist are still continuously helping us to advance and have much yet to do. To this point I will return. In the history of biology the study of form and outward behaviour inevitably came first; that of function came later and is even now less advanced. The study of function soon calls for the method of controlled experiment, and all should rejoice, I think, to know that there are twenty experimental biologists to-day for each one that was at work half-a-century ago.

Speaking as a laboratory worker to a Natural History Society, I am glad to remember that the highly-talented biologist whom that Society is honouring this evening, though from his earliest days a lover of Nature in the wild, became a highly-skilled inhabitant of the laboratory without losing any of his earlier love.

During those years when, with extraordinary skill, Bacot was illuminating our understanding of how the very small may enable the infinitely small to bring death to the big, and helping to show how that calamitous ability may be circumvented, he never ceased being a true naturalist.

It is sometimes of interest to try and discover how far something innate in each one of us has helped—circumstances apart—to determine the paths we have followed.

I will here venture, hoping for your forbearance, to intrude a fragment of personal history into my remarks. Like Bacot himself and, I suspect, like very many of my audience, I was in my early days an ardent collector of butterflies and moths and (next easiest, I think, for the boy or the amateur) of beetles. It was one day in March of the year 1878—it is just 57 years ago—that I first made, with infinite pleasure, the acquaintance of the little bombardier beetle, *Brachinus crepitans*, if that be still its accepted scientific designation. It was plentiful that year and I found it in a northern suburb of London and on the South Downs near Eastbourne. Now, when one day I beheld, without previous knowledge of their abilities, how these insects on being disturbed eject a violet vapour into the air, a most effective act for offence or defence, I felt an intense curiosity to know not only how this volatile stuff could be made and stored but in particular what the stuff could be. I tried a few experiments, putting one bombardier after another into the same test tube, and encouraging each one to shoot. The vapour condensed on the side of the covered tube and I thus collected a little of the material. It was very little, however, and I was a youth with no chemical training, so nothing came of my researches. I think, however, that from that time my fate was sealed. Though the designation was not yet invented, I became there and then a biochemist at heart.

I am reminded by a friend of a circumstance that I had quite forgotten, namely, that in the volume of the *Entomologist* for 1878 is published a note of mine on the capture of these beetles, with remarks upon the frequency of their occurrence in the Spring of that year. This was my first scientific publication. I find it contained no account of my experiments, but this I think was due to the shyness of youth.

I have learnt from Professor Major Greenwood's admirable account of his life and work that Bacot's first contribution to Natural History appeared in 1893, fifteen years after mine, but much more important. It interests me to know that Bacot's paper dealt with pigments of a lepidopterous insect, those of the larva of *Saturnia Carpini*. For I myself, a few years after I had made the acquaintance of *Brachinus* and his ammunition, became interested in the pigments of lepidoptera. In the early eighties I noticed that the wing pigments of coloured Pierids were soluble in water and felt that this gave one a chance of discovering their nature. To make a long story short, I became early convinced that these pigments were derivatives of uric acid, while the wings of white pierids contained uric acid itself. I had thus come across a case of the use of excretory substances in ornament, a phenomenon which may shock or please the aesthetic sense according to the point of view. My dealings with these pigments, owing to the need of a multitude of insects and to lack of leisure, were not published in full till 1895, the date of Arthur Bacot's first long contribution to science. The latter dealt widely, you may remember, with the genus *Smerinthus*, but a subsidiary part of the paper was concerned with the protective colouration in the larva of *S. Ocellatus*.

I am venturing to speak thus of my own early scientific adventures in connection with the awakening of Bacot's genius as an experimentalist, because I think the outcome may perhaps illustrate the truth of my earlier suggestion that something innate in each one of us may, apart from or even in spite of circumstance, determine the scientific paths (or other paths) that we are to tread. Bacot, like myself, seems to have started with an early interest in pigments, but the innate tendency of his mind led him to think straightway of their direct biological interest, in relation for instance to protective colouration, just as the same tendency carried him, through genetical studies and the like, to his classical work in medical entomology. I, on the other hand, though I would like to think that I am a biologist at heart, could not escape the curiosities of the chemist or refrain from his destructive pursuits.

I will here, by the way, just mention in parenthesis that my work on the pigments of the Pieridae has suffered, forty years after it was published, a correction which had I been younger might have seemed to me a tragedy, but now I can bear it with equanimity. These pigments, yellow and red, are sure enough uric acid derivatives, but the parent material in the scales of the white species is not, as I thought, uric acid itself but a related substance with very similar properties not hitherto known to chemists. The distinguished organic chemist Heinrich Wieland, who has made this correction, admits that for long he himself believed the substance to be uric acid, and it was, *inter alia*, the fortunate application of a discriminative qualitative test, non-existent in my time, which first led him to the distinction, so that I do not suffer greatly in pride over this happening. There is, after all, some uric acid in these white wings, though the newly described related substance is in largest amount. The biological significance of the facts remains. One among the facts has always interested me. These excretory pigments are universal in the Pieridae, but apparently sharply confined to them. The colours of other groups, in so far as they depend on pigmentation and not on physical effects, are due to quite different substances. Even when a Pierid successfully mimics an individual of another family, each insect, in spite of the similarity of colour schemes, employs pigments which chemically are typical of its own group. This confirms the soundness of a classification based on morphological considerations alone, but offers also an illustration of an aspect of affairs that will emphasise later, namely, that a *chemistry* of species always underlies or is associated with the *morphology* of species. But I have said more than I intended on this early work of my own.

Let me here repeat the hope that every field naturalist and systematist in my audience agrees with me in thinking it fortunate that experimental biologists are to-day increasing in numbers. The experimental zoologist, the plant physiologist, the experimental geneticist, and others of their kind, are supplying knowledge concerning life of a kind which descriptive biology is powerless to supply, knowledge of which there was very little before the present century began.

The study of organic functions in the higher animals—what may be called classical physiology—has been long the hand-maid of Medicine. This, of course, must remain its most important practical function. But as a branch of disinterested biological science physiology was, in consequence of its medical commitments, too long preoccupied with the mammal or, at any rate, with the vertebrate, alone. Comparative physiology, however, is now a progressive science, and is broadening our understanding of the relations between function and form. This might be illustrated from recent work done on various phyla, but on this occasion at least, with Bacot in mind, we are justified in thinking particularly of insects. For the study of form as adjusted to function (or vice versa) and the effect of environmental influences upon both, there is surely no group more interesting than this multitudinous one. In its evolution Nature has herself been a great experimentalist. In her apparent desire to make representatives of the group ubiquitous and able to cope with most diverse environments, she has had to overcome many difficulties in securing that essential physiological functions should be maintained in spite of a remarkable series of morphological adaptations.

I am sure that many here must have read the admirable little monograph on Insect Physiology by my friend (and, if on small grounds I may so call him, my old pupil) Dr Wigglesworth, of this school. One has been apt to think that relatively little work had been done in this field, yet the author confesses to having consulted 2000 references in the course of writing his book. Only a small proportion of these I imagine can have been equal in interest to the publications of Wigglesworth himself and by others in Professor Buxton's department, but the figure illustrates the extreme activity of scientific research during the last few years. It is sure that insect physiology is a fertile field from which the harvest has as yet been very incompletely garnered. Nevertheless, the survey in question is full of fascinating facts largely unknown to the average physiologist, who is primarily concerned with the mammal.

As the exploration of function progresses *chemical* problems are bound to arise, and then the biochemist may claim the right to intrude. Modern biochemistry took origin from classical physiology and on its own lines it, too, is concerned with function. Its formal or academic separation from the parent discipline—a separation which to-day is becoming common—is only justified by the fact that biochemistry needs wider contacts than does " physiology " as academically defined, and more, I think, than the study of the visible functioning of organs, it calls for wide variety in its materials. Without the inclusion of micro-organs, for instance, as well as the tissues of green plants and animals, a full understanding of the essential nature of the physical basis of life could not be reached.

You will not, I think, feel resentment if I here attempt a very brief appraisement of the present position of biochemical science. The Society has taken some risks in inviting a specialist who is also an enthusiast to address it.

I myself remember the days when many, if not most, biologists looked askance at the chemist who ventured to pretend that his methods might help to throw any significant light on life's activities. It was his business, they felt, to deal with the dead and not with the living. It is my desire that you should believe that modern biochemistry has attained to no inconsiderable success in illuminating many aspects of these activities; to success which justifies faith in its future.

The first and more orthodox task of the chemist as an organic chemist is doubtless to determine the nature and molecular structure of biological substances, but the chemist as a biochemist must not stop there. It is for him to strive for an understanding of the dynamic events in which these substances, or some of them, take part when the tissues are alive and functioning.

The pursuit of what we might call the morphological or static side of biochemistry began long ago, and is exceptionally progressive to-day. Perhaps some of the most interesting aspects of its progress are of the following kind. First, the realisation that though biological substances are multitudinous there are fundamental types of molecular structure which seem to be peculiarly adjusted to subserve the activities of the living. I am not thinking so much of the materials obtained from the environment, but rather of those which actually support the essential structures of the living cell or which display active functions within it. In addition to the all-important proteins there are other substances of which the molecular structure seems to be of almost universal importance. For brevity's sake I will mention only two classes of such, sterols and pyrrol derivatives. For my purpose here I need not stop to recall the actual chemical formulae of these substances. The fundamental structure in each case is a complex association of carbon rings, nitrogen being present in the pyrrols but not in the sterols.

Now it is a familiar laboratory experience that even a comparatively slight modification in the architecture of a molecule, which does not affect its essential type, may involve subtle and even unexpected changes in its individual properties, although the more general properties of its type may be retained. In the differentiation of biological function in its chemical aspects we seem to find economy in the employment of molecular types, advantage being taken of the effect of adjustments within the type for the production of substances exercising various necessary functions. Thus, in the case of substances of the sterol type, while one at least plays an important part in determining the static properties of the surfaces of living cells, in another the sterol structure is so modified as to give it dynamic influence as a sex hormone, while yet another among sterol functions as a vitamin. The pyrrol structure in certain associations confers that quality upon chlorophile which enables it to trap solar energy. In other associations it confers upon the respiratory pigments which contain it the power of carrying molecular oxygen from the air to the tissues, while modified, and in different associations, the same structure functions in promoting the actual oxidations which occur within the tissues, quite a different function from that of oxygen transport.

Such facts, while illustrating the chemical parsimony of Nature, also illustrate a second aspect of chemical morphology which is of great importance in her general scheme, one to which I have already referred. I mean the chemical differentiation in species which underlies the differentiation in their outward forms.

It is now a good many years since immunological studies proved to us that though all proteins belong, as it were, to one chemical genus, those which characterise each species are themselves specific. The protein type is maintained but the molecular pattern of the tissue proteins varies from species to species. But such specific differences are not confined to the proteins. Comparative biochemistry continues to reveal differences in chemical make up which may characterise different phyla, different genera, or may be narrowed to differences between species. No less than the morphologist, the biochemist can provide evidence for relationship as well as for differences and evidence even for probable lines of descent.

Such claims require illustration for their ready acceptance, but time compels me to pass on to another claim on behalf of biochemistry which I am especially concerned to make. I mean its success along the path which I have already suggested it is fated to follow, the path which should lead to an understanding not merely of the nature of dead biological materials but of the dynamic molecular events which are characteristic of life. It was this which not so long ago was held by many to be a presumptuous aim and an impossible task. I would like, however, to convince those who have not had the opportunity of apprasing it that real progress has been made towards achieving that aim.

The first step towards it was the gradual understanding of how, at biological temperatures and amid the general conditions found in living cells, the chemical reactions which support life can occur at all. The fact that they do occur was long sufficiently mysterious to be one of the chief supports of vitalism. The vague view that the occurrence of these reactions resulted from the instability of protoplasm—an instability supposedly increased by entry of oxygen into the protoplasmic complex—was as little helpful to effective thought about them as was the assumption of a Vital Force.

The mystery disappeared with the realisation that every living system is the seat of catalytic influences similar to those familiar in the inorganic world, but displayed with an efficiency and an ordered complexity which are characteristic of living systems alone. Most here will, I think, have a general idea of the meaning of the term catalysis, though, to say the truth, although it is one of the most fundamental of phenomena, easily recognised and observed, its precise mechanism is in its details still a matter for speculation. It may be thus thought about: we may picture that in a given chemical system molecules present are potentially able to undergo change in particular directions, and are potentially capable of reacting with other molecules. But at temperatures such as those which are biological the fields of force which hold the atoms together within them are so distributed and equilibrated that the molecules remain stable and inert. Such equilibrium may be disturbed by a rise of temperature in the system and activity induced, but not commonly at temperatures compatible with life. What has made possible the chemical happenings which are so essential to life as we know it is the circumstance that at biological temperatures the same activity may be conferred upon molecules by catalysis, a phenomenon which occurs when they merely make momentary contact with surface structures of a particular kind. The deep significance of this remarkable phenomenon (for though familiar it is yet remarkable) in the manifestations of life should be obvious. Such is the nature of these manifestations that we cannot imagine their display save in association with the colloid state of matter. But colloidal systems are unstable above certain critical temperatures which are low compared with those necessary for the progress of most chemical reactions. But all colloidal systems, on the other hand, are characteristically the seat of surface phenomena. In addition to their external surface they display a relatively great area of internal surfaces; in the cell, the surfaces, for instance, which separate colloidal particles from the more fluid part of the cytoplasm. It is at such surfaces that catalysis may take place. What is necessary for its occurrence is, first, that the molecule to be activated should find at the surface a structure or pattern so related to its own structure that a temporary union follows when contact is made; secondly, that the nature of the union should be such as to modify the distribution of forces (or, in other words, the electron orbits) in the molecule so that it becomes active; and, lastly, that the union should be a temporary one which rapidly breaks down with the activated molecule directed into some definite path of change and the catalyst restored to its original condition, so that it can continue its influence upon an indefinite number of similar molecules. Just such catalytic surfaces are possessed by the intracellular enzymes of which every living system contains so many. The enzymes, though special in their kind, are in the nature of their action essentially similar to the catalysts employed by the chemist in his laboratory and on a vast scale in chemical industries.

To understand why active chemical events occur in each living tissue at biological temperatures we, therefore, no longer need to look to some mysterious property of protoplasm. They are determined by objective agencies which we can study individually. It is not sufficient, however, to realise how chemical reactions are initiated in cells and tissues. We have to picture them as controlled and organised. It is characteristic of every living unit and, of course, a necessity for the maintenance of its integrity and individuality that all chemical events within it should be highly organised. All the reactions must be regulated in respect of their velocity, sequence, and mutual relations, so that each proceeds as part of an organic whole. To determine how this organisation is maintained is a more difficult problem than to decide why individual reactions occur. There is, however, an aspect of biological catalysis which, in my belief, contributes significantly to this organisation. It is highly specific. Each intracellular enzyme is able to activate one kind of molecule alone or, at most, only closely related molecules. A given reaction, therefore, can only occur at all when the right enzyme is present in the right place. Its velocity will depend upon the amount of enzyme surface available for its catalysis and its direction is determined by the precise nature of the enzyme. There are circumstances which make for organisation. This is a theme I would like to develop, but to do so here and now is not possible. My aim has been to recall to your minds the deep significance of the phenomenon of catalysis in the living world. Life is manifested in chemical systems which it seems must have remained inert but for its influence. One would dearly like to know whether life at its origin was displayed by systems which could dispense with it, and if not what was the nature of the primitive catalysts.

The recognition of intracellular enzymes and their functions enabled the biochemist to begin his experimental analysis of the events in a living cell. He has learnt how to separate individual enzymes, to place each in contact with the substance it activates, and so to follow in vitro the nature and course of individual reactions. Another advance in technique has enabled him to follow the reactions in any particular tissue as they occur in due sequence and relations. Of late years we have learnt that tissues, after removal from the body, if given proper conditions, can long survive with their normal activities essentially intact. With the technique of tissue culture, survival and growth may, as you know, be maintained indefinitely. But we can make preparations of almost any animal tissue such that in proper apparatus we can follow quantitatively the progress of chemical events within it—those involved in its respiration, for instance—and by use of the micro methods of analysis now so developed we can follow the exact course of reactions in small amounts of tissue with noteworthy success.

Such studies are relatively new, but it may be claimed, I think, that very significant knowledge has been gained by such methods. You will recall the scorn with which my lepidopterist friend of long ago viewed any claim that chemistry could possibly follow the events in active muscle. Yet we have now illuminating knowledge of the complicated chemical events associated with the contraction of muscle. We know that a whole series of chemical reactions, mutually related and interlocked, intervene between the oxidation which yields the energy for contraction and the conversion of that energy into the mechanical work done by the muscle. We seem, moreover, to be on the verge of knowing just why and how the contraction occurs when this energy is made available. To take but one other example of success: we have learnt much about the nature and course of the oxidations which occur in a great variety of animal tissues. We know a good deal concerning the enzymes concerned; those which activate the molecules to be oxidised and of other agents which activate the oxygen or bring it into effective relations with the former. Knowledge of this kind is rapidly accumulating and some of it is of a kind which was never even pictured as possible of attainment by physiologists thirty years ago.

Before leaving this laudation of my own subject, let me refer in fewest possible words to another aspect of the progress of biochemistry, or let us say of chemical physiology, if the distinction is worth while. This will, I suspect, be more familiar to you than the more recondite aspects I have been discussing: I mean the proof of the extraordinary wide influence of hormones, so called, in the organisation of the animal body. The realisation of this has surely justified the application of chemical methods of thought to biology. For the highly specific influence of each hormone, differing so widely from that of each of the others, can only be due to its specific molecular structure, and final knowledge will only come when we know just why that particular structure exerts its particular influence upon this or that tissue. It is remarkable indeed to know how the properties of particular molecules dominate the field of physiology. The work of Otto Loewi, recently extended by the brilliant researches of Sir Henry Dale and his colleagues, has taught us that even the control of activities by the nervous system does not follow directly upon the arrival of a physical impulse travelling along the nerves. These investigations have proved that a specific substance is first liberated at the nerve ending and the observed effects are due to the influence of this upon events in tissues or organs. From a local effect like this we pass to the widespread influences of circulating hormones in great variety. Their function is dynamic; in a sense at least they are catalysts. And I would not have you separate too widely in your thought the vitamins of food from the hormones made in the body. Fundamentally their functions are very similar. In surpassing small amounts both can profoundly influence dynamic events. It is, I think, an accident of evolution, so to speak, that the body can produce some such agencies at home while others it must import.

I could in any case hardly have refrained from touching on the subject of hormones, but I was further tempted to do so for a particular reason. It is so interesting to get confirmation of the belief that, in spite of that diversity of chemical characters among species on which I have insisted, there are fundamental relations common to them all.

I return to insects! More than one observer seems to have obtained evidence that hormones may function in the physiology of some insects at least. I wish, however, to refer particularly to some recent work of Dr Wigglesworth dealing with the control of moulting and metamorphosis in the hemipterous *Rhodnius protexus* by a hormone secreted in the head and perhaps by a special glandular organ, the so-called corpus allatum. This work is outstanding for the ingenuity of the experiments employed and the convincing nature of the evidence obtained. The stimulus for the production of this hormone is dilatation of the abdomen. At a critical period after a meal, but not before, the blood can be shown to contain the hormone, since such blood will induce moulting in individuals which live long but never otherwise moult owing to the removal of their heads. Introduced at the right periods this hormone-containing blood will produce precocious metamorphosis at early nymph stages. The same agency induces both moulting and the final stage of metamorphosis, and it would seem that it is another inhibitory hormone produced in very small amount which during the nymph stages prevents the premature occurrence of the latter. The story is a fascinating one which, had he lived to hear it, would certainly have given deep pleasure to Bacot.

Familiarity should not diminish our interest in this remarkable device of nature, this specialisation among a group of tangible chemical substances (many of which the chemist can already make in the laboratory and keep in bottles on a shelf) which serve to initiate, control and organise physiological events, nearly always produced in minute amounts yet with such properties that each by its intrusion into some mechanism is able to produce results which are so impressive and so fundamental.

The revelation of the existence of properties and wide influence of intracellular enzymes and of hormones and vitamins has certainly justified the application of chemical methods and chemical thought to the phenomena of life. All of them are parts of most fascinating chemical mechanisms.

I quite believe that there may be some here who find it rather hard to sympathise with this concern about mechanisms, especially among those to whom I referred in my opening remarks; those of you who love to study living beings when they are truly themselves, when they are engaged upon their proper pursuits and triumphing often so marvellously over the difficulties which the world presents even for the humblest of its inhabitants. It may, indeed, be that gifted minds with adequate intuition may after all when so engaged reach to a more real understanding of life and its mysteries than do those who pretend to go deeper by studying its physical basis.

But some seem born with an urge to see the inside of things; they suffer from a development and sublimation of the childish desire to see how the wheels go round. To judge from the facts which indulgence in this analytical habit has so far revealed, the chemical mechanisms which are associated with life form a closed system, self sufficient and suffering no interference from influences which are above mechanism. This is an important conclusion, but I would like to suggest that in accepting it one is not committed to a philosophy which is mechanistic in its fundamental outlook.

If there be truth in the philosophic dictum that the properties of the whole are always something more than the sum of the properties of its parts, it would seem to be especially applicable to the living organism, and I think most of us feel intuitively that life must be something more than an association of mechanisms. Whether science by itself can reach a decision on such a matter or tell us anything about that " something more " only the future can tell. Such great matters, however, are out of place in so unambitious an address as this of mine is meant to be.

I will return, in concluding, to what I earlier claimed to be the main purpose of my remarks, namely, to urge that biological science for its further progress has still need of service from competent workers of all kinds, and that all such belong to the brotherhood of Naturalists.

Let us admit that some few adjustments in policy may further assist that progress. It is, I think, reasonable to admit, for instance, that in the teaching of general biology in schools and at Universities the experimental side should replace some at least of the dominant descriptive side, but not so as to lead to neglect of the latter. It would seem well, too, that our Natural History Museums, in so far at least as they are meant to educate the elementary student or the general public, should continue in the endeavour, costly in space and expenditure though it be, to illustrate the natural environment of species as well as the species themselves. So significant are the relations between the organism and its environment that the field worker, and even the collector, needs to bear them in mind. In parenthesis, I might remark that in a somewhat different sense the archaeological members of the Society—to whom, I fear, my discourse can have made little appeal—well know how important it is to note and record the environment of the objects of their interest. The profound interest of the facts revealed by modern plant ecology illustrates the importance of biological associations, and every naturalist should in some degree at least be an ecologist. This means that the worker in the field who wishes to advance scientific knowledge should cultivate wide interests and, to-day, needs perhaps, like most others, special training for his work. On the other hand, I am sure that all students who are being trained in biological laboratories should as a matter of routine receive occasional instruction in the field. All these claims for the wider aspects of biology are justified, but I wish once more to protest against any suggestion that descriptive work is effete. The wise and discriminating collector and the systematist or taxonomist whom he serves have still abundant work before them of a kind which is still of fundamental importance.

Finally, let me again ask you to agree that all true biologists deserve the coveted name of Naturalist. The touchstone of the naturalist is his abiding interest in living nature in all its aspects.

Archaeological Inspections in 1935.

By G. J. B. Fox.

VISITS were made to the Church of St Peter's, Cornhill, E.C., on 9th March, and to Langley Marish Church, on 14th September.

ST PETER'S, CORNHILL.

The legend recorded on a brass plate in the Vestry attributes the foundation of the Church in 179 to "Lucius King of Britain;" this legend first appears in the "Liber Pontificalis" (before A.D. 700); that Lucius is fabulous, the historical personage being Lucius Abgar IX, King of the Britium (i.e. Castle) of Edessa in Macedonia (179-216); the chroniclers misread "Britium" as a contraction of "Britannium."

A Church may have stood near the Roman Basilica, as at Silchester, and have been followed by another actually on the site of the Basilica in Saxon times.

One result of the tradition was an ordinance in 1417 that the Rector of this Church, as a mark of honour, should walk alone *after* all other City Rectors in processions on Whit-Monday.

Perhaps c. Xc. a Church here may have served the Bishop's soke of Cornhill. Early references include a bequest in a will of 1038 to "Sce Paetre binnon Lunden," and another gift is of about the same date. Little is known of the pre-Fire Church or Churches; alterations or rebuilding took place temp. Edw. IV. The Parish Books contain entries as to whiting and colouring in 1576; to the steeple (1600, &c.); ruinous condition (1627); repairs, and appeals to the City Companies for aid (1631 and 1633); views are given by Visscher (1618), and Hollar (1647);

the Church was burnt in 1666; steps for rebuilding commenced in December 1667, and continued till September 1670, when Wren was called in; in 1675 his proposals were considered, and later, contracts were placed.

The design of the present Church is attributed to Wren, but it is possible that his associate, Dr R. Hooke, may have been concerned in the work. The total cost was £5647 8s 2d, and the new building was opened in 1682.

The plan shows a rectangle including chancel, nave, and aisles extending whole length of the building; W. vestibule with N. and S. doorways; W. gallery; W. vestry; S.W. tower; N. porch. The former chancel extended further E., but a portion was surrendered, for a consideration, in 1674, for widening Gracechurch Street. The chancel has an oak altar-table and communion rail; the reredos occupies three bays of the E. wall; the screen extends across the width of the Church, and is said to have been designed by Wren's daughter Kate; it supports the Royal Arms, and is the only Wren screen remaining in the city in its original position (another, formerly in the destroyed Church of All Hallows the Great, Thames Street, is preserved in St Margaret's, Lothbury); the pulpit retains its canopy, but was lowered in 1872; the churchwardens' pews are at the W. end; the Lord Mayor's pew at the E. end is indicated by a Sword rest of pole design, without the usual crown; the font, originally in the S.E. chapel, was presented by Samuel Purchas in 1681; the cover is said to be pre-Fire.

In the Vestibule are bread shelves, a poor box, etc.; in the Vestry are a former Communion table, portraits, etc., a copy (c. 1270) of Jerome's Vulgate used at the Holy Trinity Altar.

The organ, by Father Smith (1681) has been remodelled; the original manual is preserved in the Vestry.

The tower is of red brick, probably on the site of its predecessor; it is of four stages, capped by a lead-covered spire with a key-shaped vane; it has a XIV/XVc. crypt of ragstone. The porch has a stone vault, and its E. and W. walls are of unequal lengths.

On the S. wall is a marble tablet to the memory of seven children of James and Mary Woodman, burnt in a fire which consumed the latter's house in Leadenhall Street, 18th January 1782.

LANGLEY MARISH.

"Marish," variously spelt, has no connection with "Marsh," "Marys," etc.; it is a corruption of the name of a grantee of the manor in 1282 (Christine de Marisco); an earlier member of the family, Richard de Marisco, a Justice, appears in the "Pedes Finium" for Yorkshire, 1199-1214. An alternative name was "Langeleia sive Laverkestoke." The parish is not mentioned in Domesday Book; it was then included in the manor of Wyradisbury (Wraysbury), but was separated in XIIc.

The Church is dedicated to the Virgin Mary; its prominent features are the manorial pew, the library, and the timber arcade between nave and N. aisle. It was a chapel to Wraysbury from XIIc. to mid XIXc., when it was constituted a separate benefice. The nave dates from XIIc.; the N. aisle is a little later; the chancel and N. chapel were rebuilt in first half of XIVc.; later alterations and additions include rebuilding of chancel arch and addition of S. porch (late XVc.); S. transept added (1626); N. aisle and N. chapel widened and the oak arcade substituted (1630); S. porch enlarged to house the library (1631); W. tower (1649); W. porch (1808); whole fabric restored (XIXc.).

The Chancel:—The E. window (c. 1330) has three lights with reticulated tracery; the altar rails (1625) originally enclosed the altar on three sides; the N. wall is unusually thick (about 3½ ft.); the N. arcade (of clunch) is of two bays; the stops to the hoodmoulds enclose human heads (one is that of a bishop); the piscina (bowl cut away) ranges with triple sedilia, and the spandrels are foliated; a moulded string on the E. and S. walls mitres with the labels of the piscina, sedilia and S. doorway; a brass chandelier of 1709 is to the memory of a man named Reddington; the chancel arch has two orders, the inner resting on corbels, the outer dying into the jambs; earlier stones were reused, including one showing diaper on the N. side; the screen (late XVc.) is of oak, without doors, modern cornice; as late as 1849 it was surmounted by the Royal Arms, and tablets with the Creed, etc.

The Nave:—Part of S. wall removed when the S. transept was added, and replaced by an artificial stone screen; behind a blocked P. window is the Library; a XIV/XVc. doorway is also blocked; in the W. wall is a pointed doorway with inner quoins continued from the jambs of a three-light window not in centre of the wall; the door is original with strap hinges, and external XVIIIc. panelling; the hexagonal pulpit was given by Sir John Kidderminster in 1609 and bears his arms; the octagonal font is early XVIc., and the quatrefoil panels show roses and crowned heads.

The Kidderminster family were benefactors to the Church and parish; they were akin to Richard Kedermyster or Kyderminster, abbot of Winchcomb (d. 1531); John Kederminster became Ranger of the Royal Park of Langley, and "Master of the King's Games" to Henry VIII (d. 1558); his son Edmund married Anne Leigh of Addington related to the Boleyns (d. 1607); his son John was knighted in 1609, and the Park was granted to him in 1626 at a yearly rent by Charles I (d. 1631); his children predeceased him, except a daughter and heiress, Elizabeth, who married Sir John Parsons; the executors of their son William sold the Park in 1669 to Sir Henry Seymour.

The S. Transept:—In the gable of the window in the S. wall is a tablet with the family arms and the date 1626; below this window is a doorway; the floor is 4 ft. above the level of the nave floor; below is the family vault; on the walls of the transept is a series of coats of arms; the screen has double pillars of Coade's artificial stone; on it is the coat of arms of Sir Robert Harvey, who erected it in 1792; in the centre is a pair of iron gates. The Kederminster pew has a partition with central doorway and lattice work with sentences and coats of arms; it is six feet wide and extends along the S. wall; Sir John Kederminster secured a faculty to build an "ile or chappell," a private family pew, and a parish library; the pew is probably the most curious in the country, and its occupants were invisible to the congregation.

The arcade between the nave and the N. aisle had originally four arches of clunch, one remains at the W. end; it has been replaced by an oak arcade of three bays; the intermediate columns, in pairs, are modern; each respond has two pilasters with strap work; the date 1630 occurs on each side of the architrave.

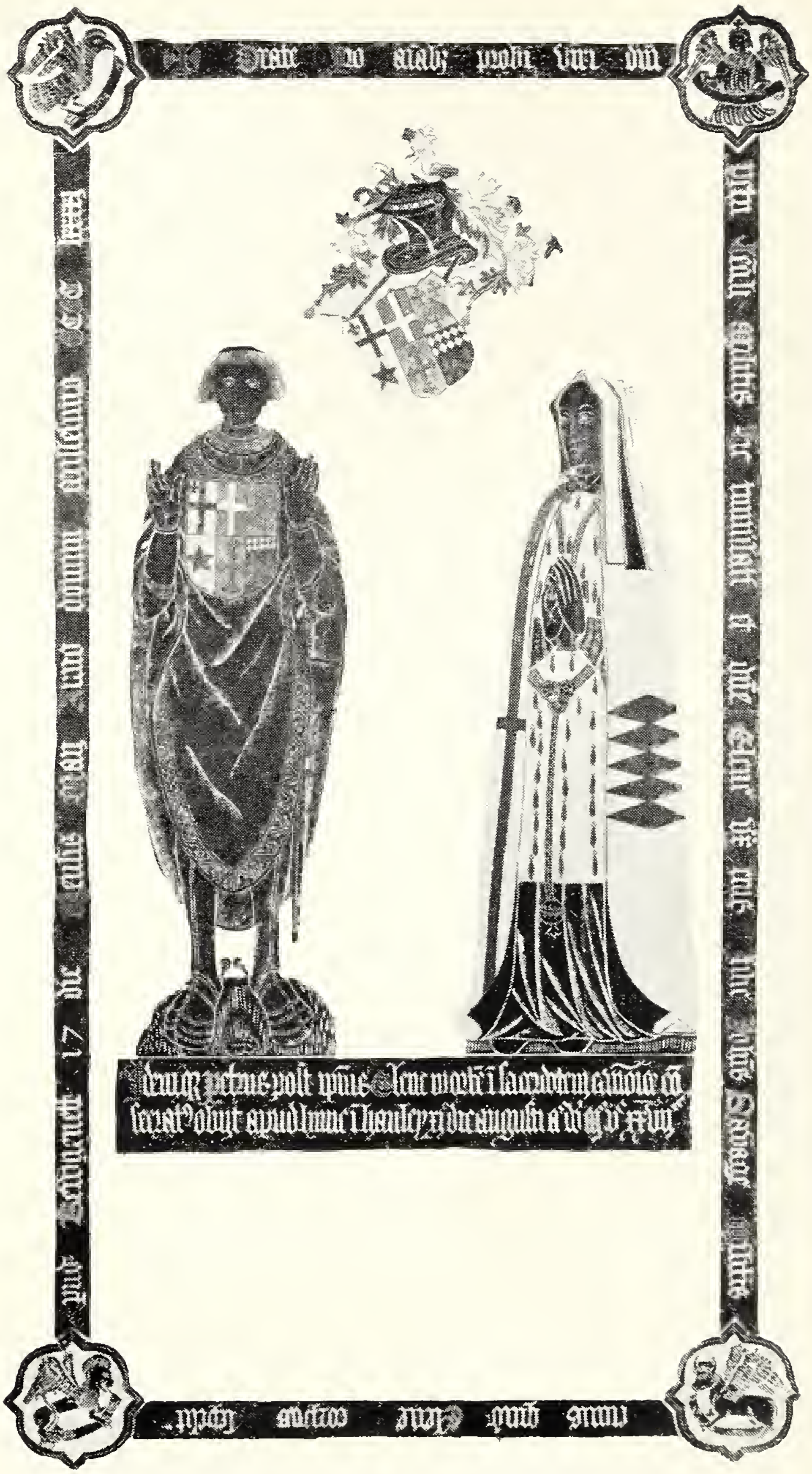
At the W. end of the N. aisle is an XVIIIc. gallery; the tower of red brick was built by Sir John in 1649; on the S. wall of the ringing chamber is a curious plaster combination of heart-shaped panels. The Library in the altered S. porch originally contained five or six hundred volumes, mostly black letter editions of the Greek and Latin fathers, an XIc. MS. of the Gospels, a XVc. missal, etc., etc.; there is a fireplace, table and chairs, and the wainscotted walls show coats of arms, views of Windsor Castle and Eton College, portraits of Sir John and his lady (the latter defaced), and figures of saints.

The principal monument, that on the N. wall of the chancel, is to the Kidderminsters, and shows their arms and the date 1599; it has two family groups, viz., that of John Kidderminster (1558), his wife Elizabeth (1590), two sons, Robert and Edmund, and three daughters; and that of Edmund (d. 1607), who put up the monument, his wife Anna (buried in West Chester Cathedral, 1618), and nine living and four dead children, all with their names; at their head kneels John with "John Miles, 1609," over him; also inscriptions, etc. (the Kidderminster arms are:—Azure, two chevronels between three bezants).

There are other tablets, brasses and slabs. Some old glass is preserved in the windows of the chapel and N. aisle, including shields of England, Clare, and others; initials; scrolls; badge of Hen. VII, etc., etc.

The plate was stolen in 1890.

BRITISH MUSEUM
NATURAL HISTORY



1527. Sir P. LEGH, w. Winwick, Lancs.
From V. and A. Catalogue of Brass Rubbings. Reproduced by permission of the Victoria and Albert Museum.

Monumental Brasses and the Evangelistic Symbols.

By W. C. Forster.

IN the parish church of Langley Marish, which the Archaeological Section visited last autumn, there is a large modern brass to Sir Robert Bateson Harvey, which has the symbols of the four evangelists at its four corners. One of the party remarked that the symbols were not in their proper order. I knew, of course, the canonical order of the evangelists, Matthew, Mark, Luke, and John, as when I was young I learnt a schoolboy rhyme which has caused me never to forget that order, but I did not remember that each evangelist had a separate corner of a brass allotted to him, and, as I thought it strange that there should be a mistake in so important a brass, when I got home I looked up my brass books and found, though each contained reference to the evangelistic symbols, none of them said anything about a proper arrangement of the symbols at the corners of brasses; also, on looking at the illustrations of various brasses which contained the symbols, I found that there was apparently no one recognised arrangement of the symbols, so I thought that a few notes on a subject connected with brasses which was not mentioned in the principal brass books might prove of interest.

I wrote to Mr W. E. Gawthorp asking him if he could give me some information on the subject. He very kindly did so, and it is largely owing to the information and references he gave me that I have been able to collect the material for the following notes.

Among the books I then consulted I found a small one on brasses by E. T. Beaumont, in which he says something about the subject. I will refer to this later.

In the following notes I make a distinction between the order and arrangement of the symbols on brasses and give the letters A, B, C, D to the symbols of Matthew, Mark, Luke, and John respectively, in that order, and with regard to the arrangement of their symbols at the four corners, the figures 1, 2, 3, 4. 1 and 2 refer to the top left and right-hand corners, and 3 and 4 to the bottom left and right-hand corners. Thus, for example, A1 means that the symbol of St Matthew is on the top left-hand corner.

It is important to remember the distinction between order and arrangement because, assuming that the canonical order of the symbols was recognised, there would still arise the question as to how that order should be arranged round the brass. There are four chief ways of arrangement: (1) top left, top right, bottom left, bottom right, that is 1, 2, 3, 4, the normal way of arranging a set of four objects round a square or oblong; (2) order of the inscription—most brasses having evangelistic symbols also have inscriptions round them—that is 1, 2, 4, 3: this arrangement is also called clockwise; (3) top left, bottom left, top right, bottom right, that is 1, 3, 2, 4: this is the arrangement the four divisions of a page are referred to in the current edition of the Encyclopaedia Britannica; and (4) top left, bottom left, bottom right, and top right, that is 1, 3, 4, 2: that is called anti-clockwise.

Thus the question is somewhat complicated when you come to consider in how many different ways the symbols can be placed in order, and then in how many ways any given order can be arranged round a brass.

The order and arrangement A1, B2, C3, D4 never occurs on mediaeval brasses; at least, I have never seen such an order and arrangement in any of the illustrations of brasses I have come across.

Before dealing any further with their order and arrangement I will say a few words about the symbols themselves.

Originally the four symbols were combined in one figure, each symbol consisting of an open book, or scroll, sometimes divided by a Greek cross, one symbol in each of the four divisions, the whole having a circle round it. Each symbol was the same, with the exception that it had the name of the evangelist on it. Later the symbols, though still combined, would be in the form of the four rivers of Paradise issuing from a mount with a lamb standing on it. St Matthew's symbol was the river Gihon, St Mark's the Tigris, St Luke's the Euphrates, and St John's the Pison. These combined river symbols are often found in early Christian mosaics.

Later again each evangelist was allotted a separate symbol—to St Matthew a winged man, St Mark a winged lion, St Luke a winged ox, and St John a winged eagle. These later symbols were derived from the vision of Ezekiel. He describes four living creatures with wings, each having four faces in the likeness of a man, a lion, an ox, and an eagle. The figures are also referred to in "Revelations."

At what date these mysterious creatures were adopted to symbolise the evangelists is uncertain, but they appear to have been used at a very early period, for the most part collectively and with a general application. About the 5th century they began to appear in art separated and individualised. St Jerome, writing in the 5th century, either allotted the symbols one to each evangelist, or gave currency to an earlier allocation. St Matthew was given the man because he commences his Gospel with the human generation of Christ and dwells on the human nature of Christ with more emphasis than the divine. St Mark was given the lion because, in his Gospel, he sets forth the royal dignity of Christ and of his power manifested in his resurrection from the dead. The lion in early times was accepted as the symbol of the Resurrection. St Luke was given the ox because in his Gospel he dwells on the atonement and the priesthood of Christ. The ox, the beast of sacrifice, fully sets forth the sacred office, and also the atonement for sin by blood. St John was given the eagle as the eagle soars on its powerful wings towards the heavens to contemplate the divine nature of Christ and to bring back to earth revelations of sublime and awful mysteries.

Later these four symbols were considered, apart from their allusion to the evangelists, to be typical of the four events in the life of Christ. St Matthew thus symbolises the Incarnation, St Luke the Passion, St Mark the Resurrection, and St John the Ascension. As the Passion occurred before the Resurrection from this symbolical point of view the order of the evangelists should be Matthew, Luke, Mark, and John. That is the symbolic order as distinguished from the canonical order Matthew, Mark, Luke, and John.

W. & G. Audsley in their book, "Handbook of Christian Symbolism," state that the most proper arrangement for the symbols round a square or oblong is what I have called A1, D2, B3, C4; that is, the symbols in the canonical order arranged anti-clockwise so as presumably to have the eagle, the symbol of the Ascension, at the top. This position for the symbols is, however, rare on brasses. I have only met with three examples.

I came across, on looking up the subject, a little book on brasses by E. T. Beaumont, the only book I could find that has any reference to the order and arrangement of the symbols round brasses. He says: "On brasses these emblems are usually placed in the following order: upper dexter St Matthew, upper sinister St John, lower dexter St Mark, lower sinister St Luke, and that after the 13th century the positions of St John and St Mark were reversed." I take this to mean that the earlier brasses usually had the symbols in the positions I have called D1, A2, C3, B4, and the later brasses B1, A2, C3, D4. It is confusing, however, to talk about dexter and sinister in this connection, as following the practice of Heraldry, the dexter side of a brass, as facing the spectator, is the left-hand side, and not the right, and vice versâ with the sinister side. This is clear if one looks at the illustrations of the Braunche brass in H. W. Macklin's "The Brasses of England." So when Beaumont says the usual position of the St Matthew symbol is upper dexter he means the top right-hand corner, but that corner in brass language is really the upper left. He must mean the top right-hand corner because brasses with the St Matthew symbol in the top left-hand corner are very rare. But if Beaumont means D1, A2, C3, B4, my list does not confirm his statement. I have come across only six examples with the symbols thus placed.

With regard to Beaumont's second arrangement, B1, A2, C3, D4, I have only come across one brass on which the symbols are so placed. Beaumont has, of course, made a slip when he says that after the 13th century the positions of the symbols were altered, because, according to my list, the earliest brass with evangelistic symbols is dated 1360, the middle of the 14th century.

There is, I believe, no certain knowledge as to how, or when, the fourfold gospel canon came to be formed. It was probably sometime during the second century, and after it had been formed, the gospels were always placed in the same order: Matthew, Mark, Luke and John. According to modern biblical criticism it is now considered that St Mark's Gospel is earlier than St Matthew's, that St Matthew's and St

Luke's were more or less contemporaneous, and that St John's was the latest.

With regard to the illustration (Frontispiece), I chose it out of the Catalogue of the Victoria and Albert Museum Brass Rubbings—the Museum Authorities kindly gave me permission to have it reproduced—because of the clear way in which the evangelistic symbols at the four corners come out. The symbols are placed D1, A2, B3, C4—the most common position. The brass is of great interest. After his wife's death Sir P. Legh became a priest, and you will notice that on the brass he is wearing his priest's robes over his armour.

I was passing the window of a firm of Church Furnishers the other day, and noticed an embroidered sermon case with the evangelistic symbols placed in the four corners, A1, B2, C3, D4, that is in the canonical order arranged in the normal way. I went inside and enquired if that was the usual way the firm placed the symbols in the work they produced, and I was told that it was. I had a very interesting talk with my informant, who told me that of course he knew that the canonical order was not the same as the symbolical one, and also that St Matthew's Gospel was not now considered the earliest of the Gospels, but that that was the conventional way, and unless their customers required any other that was the way they always used.

With regard to the List, I do not claim that it is complete, yet I think it includes most of the important mediaeval brasses in England that have four clearly recognisable evangelistic symbols round them. Only a fraction of the brasses that were originally in England now remain, and of this fraction only quite a small number have the evangelistic symbols. The Victoria and Albert Museum collection of brass rubbings exceeds 2300 in number, and of this large number not more than about 40 have the evangelistic signs, and on some of the rubbings some of the signs are either missing or undecipherable. I have looked through all the principal books containing illustrations of brasses in the Victoria and Albert Museum Library, and in the Library of the Society of Antiquaries, and also through the rubbings in the Victoria and Albert collection, and my list contains references to all those brasses that have complete evangelistic symbols that I have been able to trace.

The main fact that emerges from this list is the very large proportion of brasses that have the symbol of St John, the eagle, the emblem of the Ascension, in the top left-hand corner. This applies to 32 out of the 44 items in the list, and of this 32, 19 have the order and arrangement D1, A2, B3, C4, so this may be said to be the most common arrangement, that is with the emblem of the Ascension at the top left-hand corner, the emblem of the Incarnation at the top right-hand corner, the emblem of the Resurrection at the bottom left-hand corner, and the emblem of the Passion at the bottom right-hand corner.

The designers of mediaeval brasses were not concerned, apparently, with placing the symbols in any canonical or symbolical order round the brasses, or of adhering to any set arrangement, but thought more of the meaning of each symbol, and so put the eagle, the emblem of the Ascension, on the top left-hand corner. One brass even had this symbol at all the four corners, and another had it at the top left and right-hand corners. There is only one example of A1, B2, D3, C4, that is of the canonical order arranged in the way of the inscription.

Although this D1, A2, B3, C4 was the most general order and arrangement, as you will see from the list, the symbols were sometimes placed round the brasses in several other ways.

I have not included in the list any of the few Continental brasses which are often mentioned in the English books on brasses, or the few cross brasses with the symbols at the ends of the four arms of the cross. In these brasses the eagle is always at the top of the cross.

Also I have omitted any mention of modern brasses, as I do not know how general these are, or how the symbols are placed on them. I will, however, refer to three of such brasses: (1) to Sir Robert Bateson Harvey at Langley Marish, (2) to J. H. Monk, Bishop of Gloucester 1830 to 1856 in Westminster Abbey. On both these brasses the symbols are placed A1, B2, C3, D4, an order and arrangement I have never found on mediaeval brasses. (3) Also in the Abbey, to G. E. Street, architect, died 1881, the symbols round his brass are placed D1, A2, B3, C4, the order and arrangement which, according to my list, is the most common.

MONUMENTAL BRASSES WITH EVANGELISTIC SYMBOLS.

A = St Matthew.
B = St Mark.
C = St Luke.
D = St John.

1 = Top Left-hand Corner.
2 = Top Right-hand Corner.
3 = Bottom Left-hand Corner.
4 = Bottom Right-hand Corner.

Date.	Brass.	1	2	3	4
	Military.				
1378	Charlis, Addington, Kent,	C	D	B	A
1390	Russel, Strensham, Worc.,	D	B	C	A
1393	Walsch, Wanlip, Leic.,	D	B	C	A
1395	de Bryene, Seal, Kent,	A	D	B	C
1405	Russell, Strensham, Worc.,	D	B	C	A
1420	Calthorpe, Burnham Thorp, Norfolk,	D	B	C	A
1467	Grene, Lowick, Northants,	B	D	C	A
1505	Burgoyn, Impington, Cambs.,	D	A	B	C
1527	Legh, Winwick, Lancs.,	D	A	B	C
1557	Cheynie, West Hanney, Berks,	D	A	B	C
	Civil.				
1391	Curteys, Wymington, Beds.,	C	D	A	B
1391	Topclyff, Topclyffe, Yorks.,	D	A	B	C
1432	Carew, Beddington, Surrey,	D	A	B	C
1451	Byll, Holy Trinity, Hull,	D	A	B	C
1490	Goldyngton, Lidlington, Beds.,	D	A	B	C
1490	Taylour, Northleach, Glos.,	D	A	C	B
1502	Dormer, Thame, Oxon,	D	A	B	C
1504	Thorpe, Higham-Ferrers, Northants,	D	D	D	D
1515	Brond, Newport, Essex,	D	A	C	B
1521	Hickman, Kempsford, Glos.,	D	A	B	C
1522	Mylys, Birling, Kent,	A	D	C	B
1525	Powнder, St Mary-Quay, Ipswich,	D	A	B	C
1526	Bushe, Northleach, Glos.,	D	A	B	C
1530	Anon, Elmdon, Essex,	D	A	B	C
1533	Hatche, Faversham, Kent,	A	D	B	C
1544	Leigh, Addington, Surrey,	D	A	B	C

Date.	BRASS.	1	2	3	4
	Ecclesiastical.				
1370	de la Mare, St Albans Abbey,	D	A	B	C
1382	Campeden, St Cross, Winchester,	D	A	C	B
1389	Campedene, Stanford, Berks,	D	A	B	C
1401	Sleford, Balsham, Cambs.,	D	A	C	B
1404	Codyngtoun, Bottesford, Leics.,	D	A	—	—
1408	Avenel, Buxted, Sussex,	D	A	B	C
1420	Wytryngham, Cotterstock, Northants,	A	D	B	C
1436	Prestwyk, Warbleton, Sussex,	D	A	B	C
1458	Huntington, Manchester,	B	C	D	A
1519	Bloxham, Gt. Addington, Northants,	D	A	C	B
1528	Hacombleyn, King's Coll., Cambridge,	D	D	C	B
1529	Frowsetoure, Hereford Cathedral,	D	C	B	A
1579	Pursglove, Tideswell, Derby,	D	A	B	C
1631	Harsnett, Chigwell, Essex,	A	B	D	C
	Others.				
1510	Academical, Anon, Broxbourne, Herts,	A	C	B	D
1462	Holy Trinity, Meverell, Tideswell, Derby,	C	B	D	A
1515	Shrouds, Scolows, St Michael Coslany, Norwich,	B	A	C	D
1553	Judicial, Coke, Milton, Cambs.,	D	A	B	C

In British Mountain Flower Haunts.

By E. M. Payne, A.M.I.E.E.

THOSE who have experienced the joys of spending the major portions of long summer days above the 2000 feet altitude line will recall the glow of simple inward satisfaction at being brought into contact with the sublimely quiet serenity of some wooded glen, at the unaccustomed exhilaration of pure mountain breezes, the rugged scenery, and boundless prospects, typical of our native uplands.

But what of the wild flowers and ferns which find their nourishment in these elevated districts? Most of them are small types, and many are of insignificant colouring, but they acquire in our minds a magnified importance, by association with the rugged scenery and unlimited prospects which we view from their hiding places.

This place association—even the very smell of damp, mossy dripping rocks—is, I believe, the secret of the fascination of finding our rare mountain flowers, although, of course, many are in themselves gems of bright colour and beautiful form.

It was a vivid description of the joy of finding the Alpine plants of Teesdale by our former president, Mr E. B. Bishop, which first made me enthusiastic about our native mountain flowers.

I recall a memory of a Whit Monday ten years ago. Within a short walk from the bank of the River Tees, in Upper Teesdale, a little way above High Force, the largest waterfall in Britain, I remember cow pasture lands, at nearly 2000 feet altitude, rather boggy, and with a delightful little stream winding its way down to the mother river. I follow up the little stream, jumping across it from time to time to identify various plants, such as bright orange-coloured *Saxifraga aizoides* and Alpine meadow rue, *Thalictrum alpinum*, with its delicate maidenhair-like leaves and little yellowish flowers. The pastures are divided off by stone walls about 5 feet high, and suddenly, after I scramble over one of these walls, there is one of the most charming sights I have ever seen in England; the little stream here passes over a comparatively level piece of moorland for a hundred yards and has split up into three smaller streams, with pebbly islands in between, and these islands, as well as the banks of the streams, are carpeted with a most delightful mixture of two of our prettiest and brightest mountain flowers—*Gentiana verna* and *Primula farinosa*—thousands of stars of gentian blue blending with the bright pink heads of the primula, and both on a background of bright green shining wet short turf, and edged with the sunlit bubbling streams.

Primula farinosa has a pretty rosette of powdery green leaves, and seems to vary in colour of flower between a bright pink and a pale pink; I have found them in thousands in early June along the banks and tributaries of the Upper Tees. The sight of these plants is a sure sign that one may find many other mountain flowers close by, for our Alpines seem to flourish close together, in colonies where, presumably, patches of fertile soil are left by the very heavy floods which tear down the mountain sides and swell the streams after the snows have melted.

I am glad to say that all the plants in Upper Teesdale are very strictly preserved by the authorities of the Raby Castle estate, but, of course, there is no restriction on photographs.

Another wonder of our flora is the damp meadow land bordering the River Tees. The hay fields are literally almost choked with large violets, *Viola lutea*, particularly var. *amoena*; mostly the flowers are of a real violet purple colour, but they grade off into yellow and are all marked with the characteristic, almost human, sort of face. They grow in great profusion, the flowers almost touching each other over several acres of field, and all facing the sun. I cannot praise these violets of Teesdale adequately.

Growing with them we find the *Bartsia alpina*, a dark purple type with hairy leaves, also the quaint *Polygonum viviparum*, with a spike of pinkish and white flowers and red fruits.

Further on we can paddle across the river at the ford, which is near a farm, with the delightful name of Widdybank. Just on the other side is the classic site for *Potentilla fruticosa*, where it forms shrubs 4 feet high, crowded with bright yellow flowers.

In front of us rise almost straight up from the river's edge the cliffs and crags of Cronkley Fell and on our right the basaltic pillars and cliffs of Falcon Clints, and the waterfall known as Cauldron Snout, where the River Tees cascades in a series of leaps down the 350 ft. crags, and on their rocky faces and screes we shall find some fine mountain ferns, including what I suppose is one of our rarest ferns in England, the Holly fern, *Polystichum Lonchitis*, which forms shuttlecocks of fronds and feels almost prickly to the touch, due to its stiff spines. The pretty little fern, *Asplenium viride*, or green spleenwort, flourishes throughout this district. Near here I was fortunate to find two of our rarest plants, *Arenaria uliginosa*, Bog sandwort, and *Viola arenaria*, a very tiny violet with downy capsules.

Towards the top of these mountains we find in June the heather and peat moors covered locally with large patches of Cloudberry, *Rubus Chamaemorus*, the white flowers being in such profusion that in the distance I have thought that they were snowdrifts.

Just near the tops, where the limestone has weathered, we find areas of exposed sugar limestone which look like coarse granulated sugar. These patches are a paradise for the mountain flower lover. Here is *Helianthemum canum*, var. *vineale*. Elsewhere the sugar is carpeted with *Dryas octopetala*, the leaves resembling highly polished small green oak leaves about ¾ in. long, on a somewhat woody stem, and the flowers are brilliant white eight-pointed stars about 1¼ in. in diameter. The Teesdale *Dryas* appears to be a particularly small-leaved variety, whereas the *Dryas* of North Wales and Scotland has leaves 1¼ in. long.

Speaking of the North Wales mountains brings back to me a glorious memory of another interesting day's botanical adventures, when we set out to find the very rare *Lloydia serotina*, or mountain lily, also the *Dryas octopetala*, which were reported as somewhere in the Idwal district. Leaving a rock climbers' cottage in the morning by the side of Lake Ogwen, in the valley of Nant Ffrancon, my wife and I followed the mountain track up towards a large ancient glacial valley, with Lake Idwal nestling in the centre of a gigantic bowl, under the steep cliffs. The lake itself was fringed with the tall spikes of *Lobelia dortmanna*, whilst the rosettes of leaves carpeted the bottom in the shallow water. Searching about the foot of the cliffs, among the fallen blocks and glacial moraine heaps, we found some interesting and rare mountain plants. Various saxifrages were on the debris—*Saxifraga hypnoides* with moss-like leaves, *Saxifraga stellaris* with a rosette of leaves, and white petals with 2 orange dots at their bases, and *Saxifraga nivalis*, a dwarf sturdy plant with plain white petals and broader leaves. The Parsley Fern we found in noble clumps, delighting in the cool dampness of the rocks, as also the *Hymenophyllum unilaterale*.

The crags themselves were hanging with large clumps of the bright pink flowers of *Silene acaulis*, or moss campion. This is one of our finest cushion type plants, and we saw some on this occasion which were quite four feet in diameter—a mass of tiny pink blossoms.

In the niches or large cracks in the cliffs, also by many of the streams, we found clusters of tall golden butter balls or globe flowers, *Trollius europaeus*, like super buttercups, and often growing with them were those beautiful stonecrops, *Sedum Rhodiola*, with their purple fleshy foliage and yellow flowers. These Sedums seem to thrive in all the places above 2000 feet altitude where limestone is metamorphosed by volcanic action, and we have grown accustomed to regard them as very good natural signposts, pointing out the likely places for mountain rarities.

Now we were forced to seek shelter from a mountain thunderstorm, but contrived to boil our picnic kettle for a hot cup of tea with our lunch.

After this diversion, we decided to continue our search for the *Lloydia* and the *Dryas.* The cliff wall ahead of us seemed to be almost impassable, except for expert rock climbers, but we found eventually quite a safe way up by a cairn-marked traverse, and soon found ourselves on a plateau at about 2500 feet, with a marvellous view almost all round. We sat down close to the edge of the cliffs and rested while we revelled in the grandeur of the view, and scanned the adjacent cliffs with our field-glasses for any botanical possibilities, and there, surely enough, we spotted our English *Lloydia serotina*—rarest of our lilies—the mountain spider-wort, fifty plants at least and perfectly safe against human spoliation. We edged our way along the cliff-top and could get to within ten feet of some of them, but I could not get a satisfactory photograph. What a thrill we had in finding this treasure, the only site for it in the British Isles.

After this, we continued our walk along the 2500 feet level until we reached a spur of the mountain called the Gribbin. Most of the rocks on this tongue of the Glyder mountain are of lava and metamorphosed shales and sedimentary rocks of Ordovician age, and seemed to be very dry and rather barren. We had called a halt as it was getting misty, and were about to return to our starting point when suddenly I saw what seemed a peculiar daisy-like plant just a little higher up; we rushed over to the rock and there were about a dozen very fine clumps of *Dryas octopetala,* with scores of beautiful creamy white blossoms—eight-pointed stars. That was a splendid day and a typical one.

Two miles further south there is the enormous horse-shoe shaped massif of the Snowdon ridges.

Snowdon is probably the grandest of our mountain flower haunts south of the Tweed, and contains the greatest variety of alpines. The mighty north precipice is one enormous hanging rock-garden with Sedums, Saxifrages, *Silene acaulis,* holly ferns and oak, beech, and parsley ferns, the pretty Grass of Parnassus, yellow globe flowers, large plants of the purple *Geranium sylvaticum* and *sanguineum,* and the beautiful orange yellow Welsh poppy, *Meconopsis cambrica, Alchemilla* and countless other alpine gems. *Selaginella* and *Lycopodium Selago,* the charming club moss like miniature fir trees, are abundant.

Further east, we have the great 1000 feet precipice of Lliwedd, the ledges and summit of which are clothed with the delightful little *Juniperus nana,* a dwarf tree which creeps over the rocks, and is quite prickly to the touch.

Across the valley are the crags of Crib Goch or Red Crest, called so because of the red colour of the rocks at the extreme edge—in places here the way along is less than a foot wide, and hands were as useful as feet, as there were precipices on both sides. The north face of this red ridge is yet another veritable paradise for mountain flower seekers. The outcropping lava and the boggy screes contribute a varied soil for the nourishment of many species. I well remember the large cushions of *Silene acaulis*, the Saxifrages *oppositifolia*, *hypnoides* and *stellaris*, also *Draba incana*, and all the mountain ferns I have already mentioned. Perhaps the most striking plant here is *Saxifraga oppositifolia*, with its mat of vegetation covered with purple flowers. Its flowers are the largest of the mountain saxifrages—a very charming picture it makes.

Now let us move in imagination up to the Central Highlands of Scotland, to one of the richest floral habitats that I know—Ben Lawers. I suggest that we take a good day's ramble and look at some special favourites in June. Leaving our farm early, so that we can do most of our climbing before the sun reaches its zenith, we start off from the north shore of Loch Tay at 500 ft. altitude to reach the summit rocks nearly 3500 feet above us, and climb up at first through cow pastures and wet meadows in which we are sorely tempted to stop and admire the beautiful clumps of Globe flower and the sweet-scented spikes of the butterfly orchis, growing in spongy peat, the sweet gale, *Myrica gale*, small birch trees, *Orchis incarnata* with flesh-pink blossoms, *Habenaria conopsea*, the fragrant orchis, with its dark red spikes, and the delicate greenish white flower spikes of *Habenaria albida*, also sweet scented. In the damp woods at the edge of the Loch there are beautiful patches of *Trientalis*.

We have decided to follow up a stream bed in the west of the mountain, climb on the summit rocks and drop down on the east side, and follow down the stream known as Lawers Burn. We soon reach the Carie Burn, and its steep banks are all aglow with the abundance of wild flowers, many of our southern spring plants such as primroses, stitchwort and bluebells, only just out in flower in June. Real native Scots pines are to be found scattered about on these lower mountain slopes in small clumps, where they have been preserved from the wholesale clearance which man has made in the past 200 years.

Following up the stream to the 2500 feet altitude, we leave the larger flowering plants and the vegetation changes to the cushion types of plants, such as the saxifrages—*oppositifolia, aizoides, hypnoides, sponhemica*, and *stellaris*, while large Holly ferns are peeping from under almost every block of loose rock. An interesting plant, like a Potentilla, is *Sibbaldia* with three leaflets, which carpets large areas, and another, *Cherleria sedoides*, with tiny greenish yellow flowers in clusters, also *Alchemilla alpina* and *Antennaria dioica*.

The stream disappears in wet bogs of moss and shaley debris with plenty of large blocks of rock which have fallen from the heights above. The cliffs hereabouts are very much cracked and full of small ledges on which thousands of alpine plants take their allotted places—*Pyrola media* is here, and the crags are quite hidden occasionally by the dwarf willows, *Salix reticulata* and *herbacea* being two abundant typical species, but the whole district is very rich in willow species, and the hybrids are so critical that they are quite outside my present scope. The rocky ledges are a botanist's paradise, and we can spend a couple of hours scrambling up and down the innumerable gulleys and crags, searching for such treasures as the incomparably blue mountain forget-me-not, *Myosotis alpestris*, and looking carefully at each one to make quite sure that it is not that other blue fringed British alpine rarity, *Gentiana nivalis.*

Here also is the glorious sunny golden *Potentilla Crantzii*, growing in plenty at the base of the crags, and also *Erigeron alpinus*, with its purple rays.

Strangely enough, the common thrift or Sea Pink is growing in great profusion around the 3000 feet altitude, although we are 50 miles from the sea.

At the bottom of a high cliff we see *Cerastium alpinum*—lots of it, with pretty silvery foliage and large white flowers, also deep blue *Veronica alpina*, and the rosy flowers of the tiny *Epilobium alpinum* on a delicate stem 3 inches high. Every step that we take about here leads us to a botanical surprise—right at our feet the snowy pearlwort or *Sagina nivalis* is in little tufts.

The top of Ben Lawers is often under snow, and the rocks are very wet until May or June. Ben Lawers is given in the floras as the site for that very rare alpine sandwort *Arenaria rubella*, which flourishes in the moist debris and mossy mud just within the perpetual splashing of water which drips from the crags above. So let us keep on the alert for this tiny plant, with its white flowers, and also as we climb higher, for another speciality of Lawers about an inch high, the *Saxifraga cernua*, probably the rarest of our British alpines, and only found near the spot which we are searching. Its leaves are like those of a tiny meadow saxifrage—*Saxifraga granulata*, and the inflorescence has bright red bulbils in the axils of the upper leaves. We may see one or two plants with minute flowers nodding at the end of a very short stem —but the plant seems to rely on its bulbils for propagation.

As we scramble up one of the steep gulleys which lead towards the summit rocks, among the detached blocks of rock we see a mountain fern, *Pseudathyrium alpestre*, which looks like a small lady fern, and also another insignificant little plant, the dusky brown hairy Cudweed, *Gnaphalium supinum*, a near relative of the Swiss Edelweiss.

What probable reason is there for the existence of all these extremely rare alpines concentrated in a few square miles near the summit of our mountains? Why is it that, for example, the interesting *Saxifraga cernua* should have survived all the storms and vicissitudes of bygone ages, and remain here as a mere colony of perhaps a couple of hundred plants, while the nearest specimens of the same species are in the Arctic circle? These are problems for the modern scientist.

The ground at our feet, as we stand at the summit of Lawers, is covered with a thick felt consisting of algae, mosses and lichens, with thousands of very stunted *Salix herbacea*, also *Sibbaldia procumbens* and *Viola palustris.* This felt carpet was about an inch thick above the rocky debris, and on the summit slopes it had rolled over itself and formed wrinkles, probably due to pressure of sliding snow in winter.

I remember reading a very old book on ferns, and dealing with *Cystopteris montana*, the mountain bladder fern, it stated that this most rare mountain species was to be found in an extensive patch containing thousands of specimens above the precipices of Ben Lawers. That may have been true in 1850, but in 1935 we could not find a single frond, although we devoted to it half a day's hunting. But I did find a nice number of plants with their triangular much divided fronds on the steep crags on Ben Lui, a mountain about 20 miles to the west of this summit. After my wife and I had searched from mid-day until 7 o'clock without success, we decided to give it up and return to the base for our long homeward tramp across 5 miles of heather. I said I would just have one more glance at some inviting-looking calcareous schist ledges, and there I literally stumbled upon this most thrilling find of the holidays. The place was still another of those never-to-be-forgotten natural hanging rock gardens. *Dryas octopetala* here was so thick and the flowers so plentiful that the crag sides were almost whitened, and *Arabis petrea*, var. *grandiflora*, *Bartsia alpina*, *Alchemilla alpestris*, and Pyrolas, mosses and saxifrages were all intermingled in one extensive mat 200 feet high clinging to the dripping ledges. This spot was so delightful that we stayed in admiration until almost 8 o'clock, and then thoroughly enjoyed our moorland tramp in the light of the setting sun.

After this digression let us return home from Ben Lawers down the eastern side of the mountain, which is very precipitous, and forms a gigantic hollow bowl with a small clear lake at the bottom. The cliff sides and fallen blocks and debris at their base are wet with spray and drippings from the little streams which cascade down, fed from the spongy thick carpet of moss at the top of the mountain. On these cliff sides we shall find again almost all the alpines which we found in the morning, and here is *Draba rupestris*, differing from *Draba incana* by having its few radical leaves tufted. The rare little fern, *Woodsia hyperborea*, is to be found here clinging to the most giddy precipices, and here also we may be lucky enough to spot the other rare native Saxifrage—*rivularis*—which is somewhat similar to *cernua*, but is creeping in habit, and delights in streamsides which are fed from the coldest sources.

The lake on the east of Lawers is surrounded by peat bogs or banks of ancient peat some three to five feet thick resting on the rocky debris, and in many places this peat is cut away by water action, and there lie exposed some tree trunks with the bark still recognisable as that of birch trees, although some four or five feet of peat have collected on the fallen boughs, and this is at 2500 feet altitude. Are these the remains of an ancient Caledonian forest, which once reached so far up the mountain side? The peat bogs are here covered with heathers, *Vaccinium*, *Empetrum nigrum*, and occasionally we come across the delightful little twayblade, *Listera cordata*, with small heart-shaped leaves, and the dwarf cornel, *Cornus suecica*, with white flowers; the cloudberry also is abundant. *Orchis incarnata* and butterfly orchid and bog asphodel are plentiful. To avoid the worst of these peat bogs we make a detour on to damp grassy slopes, and see that striking little fern *Botrychium lunaria*, the Moonwort, and also the beautiful shrub—the mountain azalea, *Loiseleuria procumbens*.

At 1800 feet altitude we reach the remains of an ancient pine forest, and make a brief halt while we boil our kettle for a very welcome cup of hot tea. Then we return to our starting point over the heather moors and cow pastures, and after a good dinner at the farm we decide that we can really " call that a day."

British Butterflies in 1935.

By H. J. Burkill, M.A., F.R.G.S.

THE general summing up of the year's observations may be deduced when I state that there has been a falling off of nearly 30 per cent. in the number of my correspondents on whom I have relied for most of the records listed below. Many of the usual ones said that they had nothing of value to report, as butterflies had been scarce.

I desire, however, to thank the following for their assistance in the compilation of these notes, viz.:—Misses E. M. Gibson, C. E. Longfield, and E. M. Miller, and Messrs O. A. Alexander, G. A. Barclay, E. A. Cockayne, C. L. Collenette, G. F. Crowther, R. C. Cyriax, J. C. Eales White, R. S. R. Fitter, W. J. Fordham, F. J. Hanbury, G. H. Heath, L. Parmenter, C. Oldham, G. Richardson, G. Talbot, L. J. Tremayne, Brig.-Gen. Tulloch, D. G. Underhill, E. H. Wattson, and P. H. Willcox.

From this list the name of Mr R. Adkin is missing, a big loss, as his notes from Eastbourne during his life were always valuable and interesting. I welcome fresh observers, and trust that there will be more of them another year. Most people who get out into the country can keep notes of what they see, and such notes soon form the basis of comparison with those of other observers, so next year it is to be hoped that the list of correspondents will be considerably increased in number.

A very hot summer again with drought over the South of England might have given us a good season, but the results were, on the whole, anything but good, probably due to the cold snap in May, which affected vegetation and must have affected insect life as well. *Polygonia c-album* has been the butterfly of the year, and seems to have increased not only in numbers but in distribution. Possibly next to it would come *Eumenis semele*, of which I saw greater numbers than I had ever seen before. *Maniola jurtina* was more abundant, but that is a state we expect, and so it does not attract as much attention. On the other hand, *Vanessa cardui* was scarce. The usual Vanessids were mainly in reduced numbers, though *Aglais urticae* was an exception in some districts, probably due, as General Tulloch points out, to the fact that this is an extraordinarily hardy insect, and so was not so much affected by the very severe frost of May which did so much damage. Certainly a species that has at times been seen in every month of the year must possess a considerable amount of resistance to conditions which react adversely on other species.

The order and nomenclature in these notes are those given in the Royal Entomological Society's list published two years ago.

Danaus plexippus L. No direct records this year, but readers are advised to consult Mr C. Nicholson's summary in *The Entomologist* for November and December 1935.

Pararge egeria L. was common in a few places, but in others hardly up to the usual average. *P. megaera* L., generally in reduced numbers, but locally plentiful. *Satyrus galathea* L., fairly common in scattered places in Bucks (L.J.T.), and common at the Warren, Folkestone (E.M.M.), but in other areas not up to the average. *Eumenis semele* L., common to very plentiful from the New Forest to Cornwall, and again in Co. Cork (C.E.L.). Said to be common on Holyhead Island, North Wales (G.A.B.), while I found it very plentiful near Westcott in August. *Maniola tithonus* L. was reported the commonest butterfly in Cornwall, and on Mitcham Common (L.P.). Also abundant at Bradwell, Essex (E.M.M.), and in fair numbers in some other localities. *M. jurtina* L., abundant, Co. Cork (C.E.L.), and common in most places. *Coenonympha pamphilus* L., plentiful in places, but not to be seen everywhere. *Aphantopus hyperanthus* L., generally in small numbers, but I found them plentiful at the end of June and in July. A few were seen up to the end of August.

Argynnis selene Schiff. and *A. euphrosyne* L. are said to have been scarce except near Holt, where both were plentiful (G.A.B.). *A. aglaia* L., very few records, but Miss Longfield saw many near Dublin, 11th July. *A. cydippe* L., abundant in the New Forest (P.H.W.), and common near Holt (G.A.B.). A few at Danebury and near Folkestone (E.M.M.). One was watched for some time on Mickleham Downs on 14th July. *A. paphia* L., two seen in Richmond Park (C.L.C.). Abundant in one locality in Surrey (O.A.A.) and in the New Forest (P.H.W.). One at Hoddesdon (G.A.B.). Several seen in Cornwall (L.P.) Mr Crowther considers the numbers in Monmouthshire showed an increase, while General Tulloch saw very few, which points to a stability of habitat for the species. *Euphydryas aurinia* Rott. and *Melitaea cinxia* L. were not seen by any of my correspondents.

Vanessa atalanta L. was very local. Most observers report a scarcity, only a few being seen throughout the year, but they were common in Somerset and Dorset, very abundant at Brockhurst (F.J.H.) and in the New Forest (P.H.W.), and very plentiful in some localities (O.A.A.). Dr Cockayne says very abundant all over Romney Marshes, which rather suggests immigration there. Many were seen in September and early October at Hoddesdon (G.A.B.). Mr Cyriax reports them from Primrose Hill, Golders Hill Park, and Regents Park. Mr Richardson had five together in his garden at Tulse Hill on 1st October. *V. cardui* L., only isolated specimens seen by most correspondents. *Aglais urticae* L., generally seen, and common to very common in places, while scarce in others. *Nymphalis polychloros* L. has only a few records sent in, but I heard of several others during the year, so it is to be hoped that the improvement reported a year ago is continuing. *N. io* L. was much scarcer than usual nearly everywhere, but many were seen in the spring at Hoddesdon (G.A.B.). *Polygonia c-album* L.—In many places this now attracts little more attention than a Small Tortoiseshell, as it has become apparently well established, and is now recorded from places all round London, and from some spots in London. Mr Cyriax reports one in Regents Park, 26th July. One was taken sunning itself on the pavement on 22nd November in Capel Court, just outside the Stock Exchange. Four were together in a garden at Tulse Hill on 1st and 5th October (G.R.). I saw over 40 close together on a slope of Box Hill in August. Hibernated specimens were seen early in the year, the first date being 24th March, Richmond Park (C.L.C.). No records of *Apatura iris* L. reached me. *Limenitis camilla* L. was not so plentiful as in 1934, but is still spreading in the Home Counties. Mr Tremayne watched one outside Grand Hotel Buildings, Trafalgar Square, on 11th July, and saw it settle on the plum-coloured uniform of a Commissionaire in the street.

Hamearis lucina L. was reported from a fresh locality in Surrey (L.P.). Otherwise very few seen.

Cupido minimus Fuessl., not many records, but several specimens were seen near Reigate (P.H.W.). *Plebejus argus* L., Cornwall (L.P.), New Forest (P.H.W.), and near Holt (G.A.B.). *Aricia agestis* Schiff., a few seen in Bucks and Suffolk (E.M.G.). Some freshly emerged watched near Headley in August (H.J.B.). *Polyommatus icarus* Rott. has gone back on the previous year's increase, and was only common here and there. *Lysandra coridon* Poda, fairly plentiful, Hampshire Downs (E.M.G.), White Downs and Epsom Downs (H.J.B.). On one occasion a freshly emerged perfectly black female was watched for some minutes and then allowed to go free. *L. bellargus* Rott., no records from anywhere except Surrey, where a few were seen in different localities. *Lycaenopsis argiolus* L., four correspondents report this as plentiful (E.M.M., E.H.W., F.J.H., and G.A.B.), but others only saw reduced numbers. *Lycaena phlaeas* L., much scarcer than usual in most places. *L. dispar* Haworth, *ab. batavus*, several seen flying in Wicken Fen (E.M.G.). *Callophrys rubi* L., fair numbers in places, but missed elsewhere. *Thecla betulae* L., reported from Pembrokeshire (C.O.). *T. quercus* L.—Beyond Miss Gibson's record of " a good many larvae found in May," I have received reports of only single specimens seen or caught. *Strymon w-album* Knoch., a fair number seen in Suffolk (E.M.G.). Plentiful in one locality in North East Essex (E.M.M.), and seen near Hoddesdon (G.A.B.). These three records are all from the Eastern counties. The only other one sent in to me was of a specimen caught and released in Dovedale, Derbyshire (C.L.C.).

Leptidea sinapis L., a few seen in Surrey (E.A.C.) and a record from Kent (D.G.U.). Other recorders failed to visit the special haunts of the species. I did not go to the locality near London where I saw it in 1934, and I have not had any information from anyone there. *Pieris brassicae* L., generally in reduced numbers. There are no reports of

" a plague of caterpillars " of either this or the other two allied species. Personally I did not see any larvae on our cabbages in the garden, though the butterflies were about in small numbers. A whole day in the open would only result in a few butterflies being seen. These remarks refer also to *P. rapae* L. *P. napi* L. was in still more reduced numbers. *Euchloe cardamines* L. was about from 22nd April (D.G.U.) to 28th June (E.M.G.), and in some places was fairly frequent, while Mr Hanbury reports it as abundant in his garden at East Grinstead.

Colias hyale L. was not recorded. *C. croceus* Fourcroy was seen sparingly from 14th June (G.R.) onwards, being more noticeable to the west. Many were said to be in Cornwall (E.M.G.), and near Swansea (G.F.C.), while they were fairly common on Holyhead Island in September (G.A.B.). Several were seen on the Downs near Brighton in August (O.A.A.). *Gonepteryx rhamni* L. was noticeable in the spring, the first record being 16th March, near Hoddesdon (G.A.B.), but in many districts they seem to have suffered from the frost, and the summer emergence was not great. I found ova and larvae from 8th May to 8th June, bred them up, and saw the first (two females) emerge on 11th July. The last one reported was seen on 3rd November near Woldingham (R.S.R.F.). Mr Hanbury has raised, as Mr C. Nicholson has done in the past, the question of the food plant, as the insect is seen in districts where *Rhamnus* does not grow. The insect is, however, a strong flier, covering several miles in a day, so that it may easily wander from the areas where its food plants grow. *Rhamnus* is not closely related botanically to any other British plant, but this fact need not influence the choice of food, as many species feed on very diverse botanical forms.

Papilio machaon L.—The larvae were said to be rather scarce in Wicken Fen, possibly due to the cutting of the reeds and other herbage. One specimen was seen in Richmond Park (J.C.E.W.), which may have been liberated locally by some one who was believed to be breeding up the larvae at Petersham.

Of the Skippers, *Erynnis tages* L. was plentiful in places at the end of May and in June, as also was *Syricthus malvae* L. Several *Adopaea sylvestris* Poda were seen in West Cornwall in early August (L.P.), but otherwise it was only reported as being in small numbers. *A. lineola* Ochs. was common in two East Anglian localities (L.P. and E.M.G.). *Ochlodes venata* Bremer & Grey was plentiful in many places. The other species in this group were not mentioned by my correspondents.

Notes on Dragonflies, 1935.

By E. B. Pinniger.

THE season was later than usual, and the first species seen was *Coenagrion puella* L. on May 6th. *Ischnura elegans* Van der Lind. was out by May 27th, and *Erythromma najas* Hans. on June 3rd. During my usual short stay in the New Forest, from June 8th to 11th, I found the season a little more forward, and noted *Libellula depressa* L., *Lestes sponsa* Hans., *Pyrrhosoma nymphula* Sulz., and *Agrion virgo* L. In Epping Forest on June 16th a fair number of species were seen, including *Cordulia aenea* L.

June 26th—A naiad taken last winter at a pond in Hainault Forest emerged as a female *Orthetrum cancellatum* L.; this seems to prove that the species breeds in the district. Byfleet, on June 29th, produced many interesting species, including *Libellula quadrimaculata* L., *Somatochlora metallica* Van der Lind., *Brachytron pratense* Mull., *Anax imperator* Leach, *Agrion splendens* Harr., *Platycnemis pennipes* Pall., *Coenagrion pulchellum* Lind., and *Enallagma cyathigerum* Charp. The Black Pond, Esher, was visited on July 6th, and many species seen; these included teneral *Sympetrum sanguineum* Mull., *S. danae* Sulz., and *Palaeobasis tenella* Vill. A visit to Wisley on the same day was productive. *Sympetrum striolatum* Charp., *O. cancellatum*, and *Aeschna juncea* L. were noted.

A long list of species was made on 7th July in Epping Forest, and two insects were taken paired, in which the male was *C. puella* and the female *P. nymphula*. Byfleet, on July 14th, produced an excellent number of species, but no fresh species were out, although an interesting variety of *L. quadrimaculata* was taken. By July 21st *Aeschna cyanea* Mull. and *Ae. grandis* L. were noted in Epping Forest. During a large part of August I was in the Wye valley, where dragonflies were rather scarce; the only species seen were *Aeschna mixta* Latr., *Ae. cyanea*, *A. splendens*, and *S. striolatum*. In Epping Forest on September 8th I had the pleasure of seeing *Ae. mixta*; this is the first record there for some years.

I should like to express my thanks to our member, Mr L. Parmenter, who sends me the following records. Lists from other members would be very welcome and valuable in increasing the scope of this yearly review.

P. nymphula—Goss Moor, Cornwall, 5th August. *I. elegans*—Beddington Lane gravel pits, near Mitcham Common, 11th July, abundant 21st July; also near Hayle, Cornwall, 6th and 8th August, and common, Gwithian marsh, Cornwall, 13th August. *E. cyathigerum*—Beddington Lane gravel pits, 21st June, 11th July, and common on 21st July; Mitcham Common, 30th June. *C. puella*—Bookham Common, many, 9th June. *Lestes sponsa*—Bookham Common, 1st September. *A. virgo*—Goss Moor, Cornwall, 5th August. *Cordulegaster boltonii* Don.—

Goss Moor, Cornwall, 5th August; near Hayle, 6th August; and St Erth, 8th August. *Ae. grandis*—Mitcham Common, one on 21st July; Bookham Common, 1st September. *A. imperator*—Mitcham Common, three on 11th July, one on 21st July. *Orthetrum coerulescens* Fabr.—Goss Moor, Cornwall, 5th August. *O. cancellatum*—One male, Mitcham Common, 14th July. *S. striolatum*—Hayle, Cornwall, 6th August; St Erth, Cornwall, 8th August; Beddington Lane, two on 13th October; this species occurs every year on Mitcham Common and the gravel pits nearby. *S. sanguineum*—Bookham Common, 1st September.

Plant Gall Records for 1935.

Compiled by H. J. Burkill, M.A., F.R.G.S.

WHATEVER promises the spring held out for a successful season were rudely shattered by the very sharp frost of 16th and 17th of May, which injured vegetation severely. The drought of the summer was probably another adverse factor Consequently several species usually seen were missing, but we had the satisfaction of recording others new to us, some of them possibly fresh additions to the British list. In these notes they are mentioned first.

Picris echioides L. From galls on this plant Mr Niblett has bred a species of *Aulacidea* which the authorities at the British Museum declare to be new to science. He has also bred two further species of *Cynipidae*, which are probably new to science.

Artemisia maritima L. galled by *Rhopalomyia baccarum* Watchl. A new host plant for this midge. Bred by Mr Niblett from specimens found at Burnham on Crouch.

Tamus communis L. galled by *Schizomyia tami* Kieff. The female flower aborted with premature swelling of the ovary, due to a pale yellow midge larva. Sent up by Mr I. H. Burkill from Paignton at the end of June. More were found near Reigate on the occasion of the Section's outing on 20th July.

Acer pseudo-platanus L. galled by a midge larva. (Houard 3987.) A small depression on the under surface of the lamina in which lives a colourless almost transparent larva. The centre of the gall is brownish to dark purple surrounded by a clear light green zone, which is visible on the upper surface. Several galls found on two trees in Abbey Wood, on the Section's outing there on 1st June.

Salix purpurea L. Stem galls resembling those of *Rhabdophaga saliciperda* Dufour containing yellow larvae which show differences of structure from that species. Epsom and Barnes.

Pyrus torminalis DC. *Anuraphis aucupariae* Buckton. Found curling and twisting the leaves, which turn pinkish red. Apparently rare, as Buckton only mentions finding the insects at Horsham, and Theobald (*British Aphides*, Vol. 2, p. 308) depends on this authority and Mr Laing for his description of the insect. We obtained specimens near Stanmore, Middlesex, on the occasion of the Section's outing led by Miss Creighton in May.

Cerastium viscosum L. galled by *Brachycolus stellariae* Hardy. A new host plant record for our lists. Specimens sent up by Mr L. J. Tremayne from Dorset.

Tilia argentea Desf. galled by *Eriophyes sp.* Miss Noel sent up a leaf from Bournemouth with patches up to 6 mm. in diameter of whitish hairs densely massed together on the upper surface of the lamina, standing up from the surface .5 mm., with a slighter projection on the lower surface. I have not found any reference to a similar gall so far.

Salix fragilis L. galled by *Eriophyes triradiatus* Nal. Miss Noel reports this species from North Lincolnshire, and Mr W. P. Winter, of Saltaire, sent me some specimens of the gall from Yorkshire, thus showing the mites are travelling northwards at a rapid rate, since it is only about thirty years ago that this species was first reported for Britain near the mouth of the Thames.

Salix cinerea L. Mr E. L. King sent me some more galls of this mite on this Willow from Essex, our second record for this species as a host. The galls are spreading on *S. pentandra* L. on Wimbledon Common, and there are other galls on *S. Smithiana* Willd. now, having spread from the adjoining trees.

Plantago coronopus L. Flowers swollen and hypertrophied, to about six times their normal size, covered with a short pubescence. Swarming with *Eriophyes sp.*, probably *E. Barroisi* Fockeu., a species recorded by Houard from Madeira on the same host. Sent up by Mr I. H. Burkill from Paignton.

Arrhenatherum elatius Mert. & Koch. *Tarsonemus spirifex* Marchal. A new host plant record for our lists. Epsom Downs and near Dorking.

Artemisia vulgaris L. Galls spherical or ovoid, 5 to 12 mm. in diameter, firm and fleshy, solid, on the bases of the main stems of well-grown plants near Ockham. Examination under the microscope disclosed a number of Eelworms. A fresh host plant to our lists.

Matricaria chamomilla L. Flower heads completely metamorphosed into dense tufts of whitish hairs, resembling the work of *Eriophyes rechingeri* Nal. on *Crepis biennis* L. and *C. taraxacifolia* Thuill., but no mites were found on microscopical examination. The specimens were sent up by Mr L. B. Hall, who found them in Sussex. One large plant was completely attacked while the others in the neighbourhood were normal. Similar malformation was supplied by Mr Tremayne on *Pulicaria dysenterica* Gray last year, but here again the cause defied detection.

The following species are selected as being of interest from among a mass of records made during the year:—

CYNIPIDAE.

Oak Galls were much below the normal numbers, both in the spring and autumn generations.

Papaver Rhoeas L. was only sparingly attacked by *Aulax papaveris* Perris, a great contrast to the previous year.

Tragopogon minus Mill. and *T. pratensis* L. provided many galls of *Aulacidea pigeoti* Kieff.

Centaurea scabiosa L. produced a number of galls of *Isocolus scabiosae* Gir., but only a few *I. rogenhoferi* Wachtl. and no *I. fitchi* Kieff.

Nepeta hederacea Trev. supplied *Liposthenes latreillei* Kieff. in four localities, but never plentifully.

Sonchus arvensis L. was searched for galls of *Timaspis sonchi* Stefani whenever seen in the autumn but no specimens were found this year.

TENTHREDINIDAE.

Sawflies were little in evidence, one feature of the year being the almost complete absence of *Pontania proxima* Lepel. *P. salicis* Christ was seen at times on *Salix purpurea* L., and *P. pedunculi* Hartig was obtained on *S. aurita* L. Bud dwelling and leaf rolling species were scarce.

COLEOPTERA.

Populus tremula L. carried more than the usual number of galls of *Saperda populnea* L., and further good examples were found on *Salix cinerea* L.

Campanula rotundifolia L. on Epsom Downs was again much attacked by *Miarus campanulae* L., and *Trifolium repens* L. was found on Fetcham Downs galled by *Apion laevicolle* Kirby (I. H. Burkill).

LEPIDOPTERA.

Very little was observed in this order, but more swollen stems of *Heracleum Sphondylium* L. attacked by a species of Micro-lepidoptera were found. The insect, however, was not bred out.

CECIDOMYIDAE.

Among the Midges the following are perhaps the best of a number of records:—

Cornus sanguinea L., flower buds swollen and unopened, each containing a midge larva, yellow in colour with orange ends.

Viburnum lantana L., flower buds swollen by larvae of *Contarinia lonicerearum* F. Loew, and *C. viburni* Kieff. The leaves of this host plant showed more than their usual crop of galls of *Oligotrophus Solmsii* Kieff. along the North Downs.

Conium maculatum L. provided *Lasioptera carophila* F. Loew, on Box Hill and near Headley.

Tilia platyphyllos Scop. Leaves galled by *Oligotrophus Hartigi* Liebel. Downs Lane, Leatherhead.

Hieracium umbellatum L. Flower heads swollen, containing a number of pink larvae. Broadmoor.

Achillea millefolium L. The galls at the base of the stem, new to us last year, were again found, but only in small numbers.

Ulmus montana Stokes. *Oligotrophus Lemeei* Kieff. In spite of the trees in Downs Lane, Leatherhead, being heavily cut back, this gall seems to be holding its own there.

Silaus flavescens Bernh. was very severely attacked by *Trotteria umbelliferarum* Kieff. in the autumn.

Brachypodium sylvaticum Roem. & Schult. The galls of *Poomyia Hellwigi* Rubs. though searched for in many places were only found once.

Populus tremula L. Mr Niblett has been successful in breeding out flies of *Harmandia cavernosa* Rubs., *H. globuli* Rubs.. *H. tremulae* Winn., *H. pustulans* Kieff., and another species of *Harmandia.*

Corylus avellana L. *Stictodiplosis corylina* F. Loew was very abundant at the end of the year, nearly every bush carrying a large number of the galls.

MUSCIDAE.

Achillea millefolium L. *Oxyna flavipennis* H. Loew. Found again at Fetcham.

Salix cinerea L. *Agromyza schineri* Giraud. Wimbledon.

PSYLLIDAE.

Urtica dioica L. *Trioza urticae* L. Plentiful in the autumn. The appearance of this species seems to be very irregular, as five or six years may pass without it being noticed, and then it becomes abundant.

APHIDIDAE.

Lonicera periclymenum L. *Siphocoryne xylostei* Schrank was seen much more frequently than for some years.

Gnaphalium uliginosum L. *Pemphigus filaginis* Fons. Plentiful at Downside.

Populus pyramidalis Rozier. The form *marsupialis* Courchet of the last species, and *P. spirothecae* Pass. and its form *affinis* Koch were taken at Ockham.

ERIOPHYIDAE.

Tilia vulgaris Hayne. *Eriophyes tiliarius* Con. Hawks Hill, Fetcham.

Campanula glomerata L. *E. campanulae* Lindr. and *E. schmardae* Nal. Two stations on Box Hill, some distance apart.

Viburnum lantana L. *E. viburni* Nal. Very plentiful and large this year.

Gentiana Amarella L. *E. kerneri* Nal. Only occasionally.

Artemisia vulgaris L. *E. artemisiae* Can. Very fine specimens found by Messrs Ross and Niblett on Epsom Downs and near Wisley on the Section's outings.

Corylus avellana L. *E. vermiformis* Nal. The galled tree near Headley has broken down under the weight of the gall and died.

Jottings of a Naturalist in France and Italy.

By J. A. Simes, O.B.E., F.R.E.S.

THE observations which I am about to bring to your notice have been made for the most part in happy hunting grounds in France and Italy: but with your permission I shall have occasion from time to time to disregard the limitations of political frontiers and to discuss cognate observations made in other countries of Central and Southern Europe. To make observations in the naturalist's sense means a sojourn as prolonged as possible in a wild region remote from populous centres. Such spots are to be found, of course, in the northern parts of Scandinavia; but to reach them many days' travelling is required, and on arrival one is apt to find one's movements very much restricted by bog and mountain over which there is no practicable passage. Albeit there is a fauna and flora of surpassing interest in the areas abutting on the Arctic Ocean, including quite a number of interesting butterflies. These latter for the most part are small fritillaries (*Brenthis*) and Clouded Yellows (*Colias*); but there are also a few Satyrids, a *Melitaea*, and one or two blues (*Lycaenids*). Some are to be found only on the margins of the polar sea and the adjoining bogs, such as *Brenthis chariclea*, *B. polaris*, and *Colias hecla*. One, namely, *Colias nastes*, f. *werdandi*, is of complete circumpolar distribution. Others, though less insistent on a home near the sea, are nevertheless of essentially boreal distribution, e.g., *Melitaea iduna*, *Brenthis frigga* and *B. freya*; while yet others, though extending to the extreme north, are to be found on all suitable bog lands throughout the length of the country. Into this last category fall *Colias palaeno*, *Brenthis arsilache*, *B. aphirape*, *B. thore*, and *Vacciniina optilete*. Their distribution, however, by no means ends in Scandinavia. All, except the elusive *B. thore*, are to be found again on the Belgian bogs in the vicinity of Spa: and thence they extend southwards and eastwards through the Vosges, the Schwarz Wald in Baden, and the bogs in the vicinity of Zurich into the heart of the Alps and Carpathians. In their home in northern Scandinavia they haunt country at no appreciable elevation above sea-level; in the Belgian and Baden haunts they reach an elevation of about 2000 feet; but in the Alps their habits change considerably and *Colias palaeno* is hardly to be met with until an elevation of some 6000 feet is reached. It is clear, then, that altitude as such is not the condition essential to the insect's existence as Alpine collectors often suppose. For my part I am inclined to think that the insect's requirements are rather related to water. So long as a suitable water-logged terrain can be found at low levels the butterfly is content to stay there, otherwise it must betake itself to the levels at which such a habitat is provided throughout the summer by the melting snows.

Perhaps we should go back to the last ice age for a clue to another extraordinary problem of geographical distribution in Europe—the occurrence of several species in Central and Southern Spain and nowhere else except South-eastern Russia. I refer, of course, to *Zegris eupheme*, *Lycaena pylaon*, *Satyrus prieuri* and the giant form of *Parnassius apollo*. There must, of course, have been at one time a bridge connecting these widely sundered colonies; and there has been much speculation as to what that bridge was. I think there is evidence to support the view that in the not remote geological past there was land connection between the eastern end of the Atlas range in N. Africa and Europe viâ Sicily, Italy, Greece and the archipelago: and it is probable that there was continuous distribution through this area. It is significant that another butterfly, *Euchloe damone*, is to-day found in Algeria, Tunis, Sicily, Greece, and the Balkans.

I said just now that altitude as such is probably not the factor which determines the habitat of species, although one is apt to gather the impression from text books that one may always expect to find such and such a species at a given altitude. This is only true of very limited districts. For example the Lycaenid butterfly, *Albulina pheretes*, is to be found in the Valais (at Arolla) at 7000 feet. In parts of Dauphiné I have found it at 4000 feet; while in the Himalayas a race has been recorded at nearly 20,000 feet! Again, at the eastern end of the Pyrenees, rising, as they do, in Canigou to 9000 feet, it is not possible to get high enough to find the real Alpine insects. Lowland species like *Gonepteryx cleopatra* and *Maniola jurtina* are common at 7000 feet; and the Sphingid moth, *Deilephila livornica*, common at sea-level on the Riviera and in Southern Italy, was abundant at dusk over the Alpine rhododendron at 7000 feet. Small wonder then that no trace of *Latiorina orbitulus* was found until one reached 8500 feet! Clearly it is misleading to define a habitat, except a purely local one, in terms of altitude; and I suggest that a much better idea would be conveyed if it could be defined with reference to the snow-line.

One further word of criticism. There is an oft-repeated statement to the effect that *Colias palaeno* when found at low elevations in Belgium and Germany has lost the powers of vigorous flight which characterise it in the High Alps. I can say positively that so far as the Belgian colony is concerned this is erroneous. On the Baraque, near Spa, it flies quite as powerfully as it does on the Simplon. True, it is much easier to catch in Belgium but that is accounted for by the high wind which gets up every day in the Valaisan Alps as a result of the heating of the air in the Rhone Valley and the Lombard plain. It blows so strongly that any butterfly rising two or three feet above ground is caught in the current and carried half a mile away in a matter of seconds. That, I opine, is how *Colias palaeno* in the Alps obtained its reputation for strong flying. A precisely similar phenomenon occurs in the Pyrenees.

It is a matter of regret to me that in all my expeditions in search of butterflies I have never been fortunate enough to witness insect migration on a really big scale. There is, of course, nothing in Europe to compare with the vast movements of tropical Lepidoptera such as are frequent in the genera *Catopsilia* and *Urania*; but for all that there must be migrations of considerable dimensions on the part of species like *Colias croceus* (*edusa*), *Vanessa cardui* and others, though I have never seen more than a few examples thus engaged. A far more regular traveller in my experience is our common small white, *Pieris rapae*, which is wise enough to travel alone and eschew the "conducted tour." I have rarely crossed the Channel in the summer without seeing several; and I have similarly observed them crossing the Adriatic, the Bay of Naples, the lagoons at Venice, as well as the large Italian lakes, Como and Maggiore. They fly about 6 or 8 feet above the water and maintain a steady 8 to 10 miles an hour. I have seen them fully 30 miles from land and I have never seen one come to grief. The nearest approach to a real migration overland that has come under my notice concerns another Pierine butterfly, *Aporia crataegi*. In 1912, when ascending the valley of the Guil, near Briançon, we observed great numbers of the species on the wing and all were proceeding down the valley of the Guil towards its junction with the Durance. The flight was observed to continue as we mounted several miles but terminated before we reached Abriès. During a stay of several days in the upper part of the valley we saw hardly a specimen. All the insects which we could examine were males. The question arose in my mind whether a local movement of relatively small proportions such as this might be brought about as a result of a disproportionate production of one sex through climatic or other causes.

A good deal has been written of recent years anent the drinking habits of butterflies; and in the course of my journeyings I have devoted considerable attention to the matter more especially with reference to the connexion of the habit with sex. Tutt used to maintain that it was only the males which were thus given to drink—a dictum which was, I remember, the motif of some verses in "Punch" headed "Tut! Tut!!" More than ten years ago an observation made at La Ste. Baume in Southern France showed me that there were exceptions to the rule for the only three specimens of a hairstreak butterfly, *Laeosopis roboris*, observed drinking were females. Subsequent observations added to the exceptions; and in July and August 1934 I noted quite a number of females drinking at water courses at Digne in the Basses Alpes. I will not trouble you with the details for they have been published in the Proceedings of the Royal Entomological Society. Suffice it to say that the species involved were nearly all Satyrines. Digne is one of the hottest spots to be found in Central Europe: and insects of all orders were daily to be seen at the margins of a tiny stream issuing from an ice-cold spring. Of course these female butterflies represented only a small proportion of all the butterflies found drinking, the vast majority being males. In fact one may say that the drinking habit is born in the male and is adventitious in the female. I must say, however, that when the female *does* develop the habit she indulges it with an amazing assiduity. I call to mind a ♀ *Aporia crataegi* which was observed "taking the waters" morning after morning, till finally we found her lifeless body afloat in a pool.

I am sure that in many cases what was imbibed by the insects was the purest of water uncontaminated by any animal substance; but in other case there were grounds for thinking that animal exudations or excreta were the primary attraction. Many butterflies of both sexes were attracted by human perspiration and settled on our hands, clothes, haversacks, nets and boots. *Satyrus arethusa* was so persistent that it soon became known as the saucy arethusa! Still other species paid little attention to the water but evinced great partiality for decaying animal or vegetable substances. Carrion, offal, and animal garbage generally, attract many butterflies—notably the genus *Apatura*, *Charaxes jasius*, and many skippers. Others again, though they have nothing to do with animal matter, are strongly attracted by fermenting plant juices such as they find in exuding sap and over-ripe fruit. To this group belong the Vanessids, especially the Red Admiral, *Vanessa atalanta*. Indeed, the various kinds of fluid to which I have referred are to a large extent selective, and one could devise a graph showing every gradation from flower secretions to animal and vegetable refuse, with different groups coming into the picture step by step. It would begin with insects like the fritillaries (*Argynnis*) and many female Lycaenids which are exclusively flower patrons; then it would proceed to species like the Wood White (*Leptosia sinapis*) which drinks pure water in addition; then would come the males of most Lycaenids, which like a little something in the water, and so on. In the middle we should have the species of maximum proclivity which are attracted to all the various kinds of liquid mentioned, and here undoubtedly would come the graylings (*Satyrus*). From that point there would be a decline until we reached the species which specialise absolutely on particular juices such as those of animal and plant refuse.

The French and Italian Rivieras are well known as a sort of paradise for the naturalist. Perhaps they are less so to-day than formerly owing to the bungalow plague: but if you go a few miles inland you can generally find good country where the bungalow ceases from troubling. In this area you may still find all the plant and insect treasures of the Midi. Three out of the four European species of Swallow Tail (*Papilio*) are to be found here, the most abundant being *P. podalirius*. Its bright green larvae are easy to find on blackthorn, generally on quite low bushes. I found that the Praying Mantis sought out and devoured these larvae though I could not get a Mantis to eat a larva of *P. machaon*. Doubtless the secretion of the prothoracic glands of the larva of *machaon* is the protecting agency. On p. 101 of the *London Naturalist* for 1934 I published a note on an interesting observation on some pupae of *podalirius* to which I should like to refer you.* The third species of Swallow Tail of these regions, namely, *Papilio alexanor*, produces only grey pupae. The pupae moreover are curiously flattened and I have no doubt that they are in nature attached to the rocks. The rock of the area is a grey limestone, and a green pupa would, of course, be very conspicuous on it. By the way I found that in captivity the larva of *P. alexanor* will feed on fennel and parsley; and that

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*A larva, bred from an egg found in Austria in June 1935, produced a *green* pupa late in August and the butterfly emerged in September. This corrobates the observation referred to above.

machaon will eat parsley as well as the shrub, *Skimmia japonica.* Only once have I found a paired couple of any *Papilio.* It was at La Rochelle in August 1932, when I found a pair of *machaon* on a flowering stem of a yarrow and their weight bent the stem over to a horizontal position. As thus poised they were almost passed by as being only a spider's web, the long streaks on the underside looking exactly like the radiating strands. The various species of *Vanessa*, too, are rarely found paired in Nature—indeed, I don't think I have ever seen a paired couple of any of the species, common as they are. More than once, however, I have witnessed the strange courtship of the small tortoiseshell—the curious pirouetting flight followed by a long pause on the ground during which the antennae of the male extend over the hind wings of the female and keep up a perfectly audible drumming. Speaking of paired insects in nature reminds me that in July 1934 I saw on the Cheval Blanc, Basses Alpes. an instance of pairing between two quite distinct species. The male was *Zygaena fausta* and the female *Z. filipendulae.* The eggs were infertile.

One of the wildest tracts remaining in this region is to be found in the Estérel Mountains; and here is the chief stronghold of *Charaxes jasius*, the sole european representative of a genus which inhabits tropical Asia and Africa. It only manages to maintain itself in the hottest parts of the Mediterranean coast from Spain to Greece. Its larvae are found on the Arbutus, but only on the southern side of bushes with southern aspect exposed to full sun. The butterfly is occasionally attracted to decomposing animal matter and it is said that in the earlier brood it is fond of over-ripe cherries. I have never known it to visit flowers, but Dr Rosa recorded several years ago that at Loutraki on the Gulf of Corinth in Greece one particular plant of Mullein (*Verbascum*) attracted a number of the butterflies day after day. There were plenty of other Mullein plants in blossom but never a *Charaxes* on any of them. I think we must conclude that this was not a case of floral attraction. There was probably some exudation on the plant—possibly the secretion of aphids which will to my knowledge sometimes attract the butterfly. Usually, however, if one wants the butterfly one must take it flying, and that is a job for the young and athletic. *Charaxes jasius* roosts high up in the cork oaks, choosing the deep furrows in the cork above the point to which the bark is stripped; and there in the shadows amongst the bearded lichens it is perfectly protected by its underside colouration. *Satyrus circe* is fond of roosting in similar spots.

In August in the Estérels there was a plentiful late brood of the interesting *Melitaea didyma*, a species much given to local and seasonal variation. In this August brood the females had lost all semblance to the *alpina* form and often were of a lighter brown than the males. Some were so light as to remind me strongly of the *neera* form which I took in Corfu, Greece, a good many years ago. In these seasonal forms of *M. didyma* one sees, perhaps, the beginnings of alternating distinct forms such as are well known in the wet and dry season forms of *Precis* and other genera.

In the last few years I have paid a good deal of attention to the enemies of butterflies; and amongst the more formidable of these must be reckoned the lizards. They are always alert and watchful, and will chase a shadow cast by a flying insect in the hope that the insect may alight on the rocks. *Sesia stellatarum*, as well as many Satyrine butterflies, are fond of sunning themselves on the rocks and many fall victims to the lizards. In Southern Italy I have seen a lizard devouring the rare *Melanargia arge*, and I have found numerous wings of other victims.

In the flowers themselves are other enemies. Thomisid or "Crab" spiders, coloured like the blossoms, lie in wait on many a flower head. The abdomen of the spider is drawn deep down into the flower head leaving only a pair of callipers out on the surface; and with these they seize any insect alighting on the blossom. I have seen even a large Swallow Tail perish thus as well as many smaller species. In a stretch of some 200 yards of *Eupatorium* in blossom at Digne I saw one morning five or six butterfly victims.

Wasps account for a goodly number of the smaller species. The Holly Blue (*Cyaniris argiolus*) and the Wood White (*Leptidea sinapis*) were very given at Digne to alighting on moss-covered stones in the stream bed for the purpose of imbibing moisture from the moss. In this position they were most conspicuous and the wasps repeatedly picked them off.

The beaked Reduviid bugs also capture many and they will eat even "nauseous" species like the Burnet moths.

Dragonflies again are formidable enemies to butterflies and insects of many kinds. In a forest in N.E. France I was puzzled one day by a big dragonfly which was flying about grappling another insect almost as big as itself. Presently it settled and I was able to see that the victim was another dragonfly which was still alive although most of its head had been eaten off. The great southern Ant Lion, *Palpares*—a relation of the dragonflies—is every whit as voracious. I once captured two and placed them in the same box. When I reached the hotel there was only one *Palpares*.

During this last year or two I have made some observations on grasshoppers to which I must refer very briefly. While in the Estérels in 1933 I noticed that many grasshoppers had a reddish tinge like the red rock; but the same species on the limestone not many miles away was grey like the limestone. In 1934 I was able to show that this form of adaptation extended to more than one species. All insects with this type of colouration alighted only on rock or soil where their colouring protected them.

Another species was dappled with yellow and green. It was found in stubble fields where green weeds were beginning to appear amongst the yellow wheat stalks and matched its environment perfectly. When it flew it never alighted on rock or soil but always on vegetation.

Yet another species found at about 5000 feet on the Cheval Blanc in a remote district of the Basses Alpes was almost uniformly black. When disturbed it always alighted on blackened areas of dead vegetation.

At Digne in July I frequently saw a species of *Chrysis* or Fire-tailed Wasp. I was surprised to find when I netted them that they feigned death, assuming an extraordinary posture for a winged insect, namely, rolling up into a ball like a woodlouse. In this posture they looked like the berries of an adjoining shrub. Nothing seems to be known of the purpose served by this habit.

There can be no doubt that Digne, the rather dirty little capital of the Basses Alpes, is a wonderful entomological locality. It has long been famous amongst butterfly hunters and you will understand why when I tell you that one morning in July 1934 I counted 63 species within 4 km. of the town. And the number of individuals, especially in the famous gorge, was amazing. Never have I seen more butterflies in a small area, and never have I had a better opportunity of observing little known insects of other orders than were afforded to me at Digne.

You will remember with what joy Fabre, after 40 years' arduous toil, found himself the proprietor of a little patch of *harmas*, or sterile land, at Serignan in the vicinity of Avignon. What a pity he was not acquainted with Digne! He could have procured there a plot equally impossible of cultivation, but one vastly richer in all the aromatic herbs of the south and with a teeming and diversified insect population. And without difficulty he could have had access to many different types of country with their characteristic fauna and flora. A score of kilomètres or so would be all that separated him from the slopes of the Cheval Blanc with sub-alpine plants and insects. A few kilomètres more and he would reach the Col d'Allos with high alpine and nival forms. And once in a while he might have contrived the wonderful journey through the gorges of the Var to Cannes and the cork and pine forests of the Estérel. How vividly he would write of the golden haze which ushers in a day of the Provençal summer; of the tiny red islets lapped by the blue sea off La Napoule; of the sheets of sky-blue Ipomaea covering lattices with new glory each morning—to fade at noon; of the mysterious hawk-moths, appearing like wraiths at dusk to poise over calyces of Plumbago and Oleander, and continuing to haunt the blossoms when it is too dark to see them, though the sudden depression and rebound of a spray of luminous blossom testifies to their ghostly presence. And so should he have passed his latter years in the fulness of joy. It is only a naturalist such as he who can know the real soul of the Midi; and it is only such as he who can experience the depths of happiness, the peace of mind and the contentment of spirit which are born of the sights, the sounds, and scents of Provence. Florian must have realised this when he wrote:

J'observe, et je suis la nature:
C'est mon secret pour être heureux!

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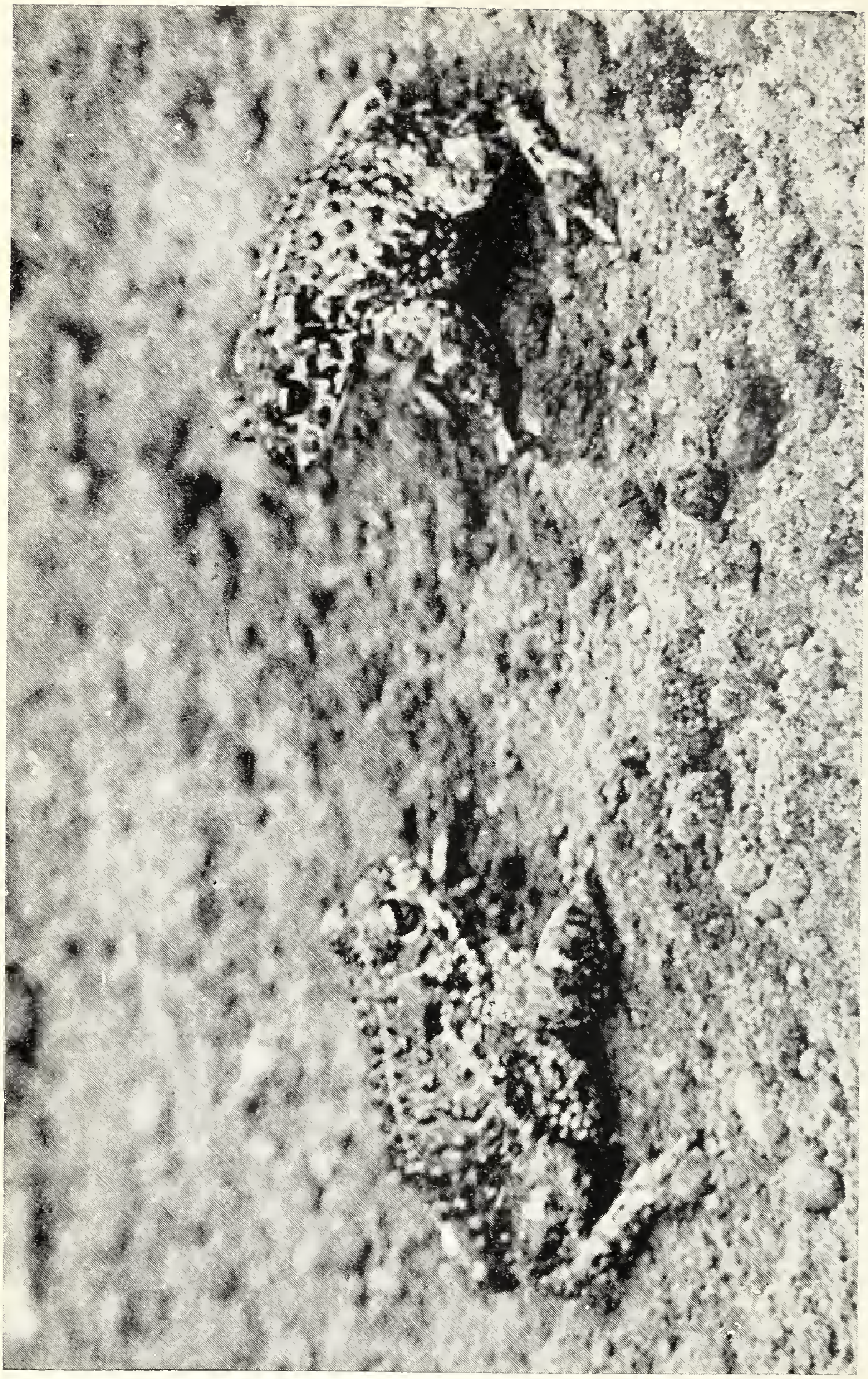

NATTERJACK TOADS.

The Natterjack Toad.

A LOCAL BRITISH SPECIES.

By L. G. Payne.

THE Natterjack or Running Toad, *Bufo calamita* Laurenti, is one of the three species of Tailless Amphibians recognised as native to the British Isles, the others being the Common Frog and the Common Toad. The Natterjack should be of special interest to the London field naturalist as it was undoubtedly indigenous to a few of the metropolitan Common lands, and occurred there in some frequency to within recent years.

That this toad was well known in early times is almost certainly indicated in the present word " Natterjack," the origin of which goes back to Anglo-Saxon days, when the word " naedre " and later " nadder," meaning " nether " or " lower," was applied commonly to the snake tribe and to-day is perpetuated in the name " adder." The suffix " jack " is possibly a term of contempt, or a diminutive, though one writer quotes the old German " jager," " one who runs." In this connexion it is interesting to note that the amphibian may to-day be correctly designated " Natterjack," without the addition of the descriptive " toad," and, further, that adders usually abound on the sandy soils favoured by the Natterjacks.

It is not my purpose to enter into a technical description of this species, but it may be helpful to enlarge on some characters which will at once differentiate the Natterjack from the Common Toad.

The unfailing mark of distinction, so far as British specimens are concerned, lies in the narrow yellow vertebral line which extends from the snout to the vent. This stripe, and the prominent cutaneous glands, are best observed in a specimen taken from the water. Then it is that the beautiful green, yellow, and olive markings become conspicuous, while the poison-secreting parotid glands appearing as raised brownish patches behind the eyes will attract attention. Similar glands occur as prominent warts along the dorsal surface, and, in specimens from Norfolk, these are frequently of a reddish colour. It should be noted that this poison is the toad's only protection against its enemies, and even so cannot be expelled at will. The expulsion may be induced under rough external pressure as when the creature is seized by a dog.

The field naturalist need not fear, however, that he is likely to experience the ejection of this secretion, for in the course of many years' observations and much handling of specimens I have yet to witness personally the nature and effect of this means of defence. It is stated to consist of a viscid, milky, and odorous fluid which affects the heart and nerve centres.

Numerous smaller glands also are dotted over the skin surface. These conserve the skin in the moist condition necessary for the normal functioning of cutaneous respiration. Experiments have proved that this " breathing " through the skin is auxiliary to pulmonary respiration, and that the latter is insufficient in itself to support life.

The Natterjack is distinctly gregarious, and on this point contrasts with the Common Toad, which except at breeding times is usually satisfied with his own company.

It is interesting to observe the speed with which the Natterjack digs into loose sand. In a very few seconds he can press below the surface, deftly kicking the sand over himself with the hind legs. In firmer sand he digs away with his forelegs, throwing the excavated soil below and behind him in the manner of a terrier scenting a rabbit.

The Natterjack is a distinctly local species, occurring in more or less scattered areas of well-drained sand and gravel formations. These limitations result in a somewhat curious comital distribution. It is found in parts of the East Anglian levels, around the sandy estuaries of the Dee and Solway, and more rarely amongst the pine and heather areas of the home counties. With regard to the last named, some facts relating to distribution will be of interest. Thomas Bell, in his *History of British Reptiles*, 1849, 2nd Edn., states:—" It is common on Blackheath and in several other places in the neighbourhood of London." Wimbledon Common was long known as a locality for the Natterjack, and three were taken there in 1884. Wisley Common, Surrey, appears at one time to have been a favourite haunt of the species, as the following extracts from a letter published in *Science Gossip*, 1865, will prove:—" On Thursday, April 6th, I was looking about Wisley Heath . . . . and caught no less than fifty-seven of them. . . . . On Friday night I caught a still larger number . . . ."

One cannot help commenting adversely on these naive admissions, and speculating as to the fate of the fifty-seven, and the " still larger number " of that Black Friday, and wondering to what extent this excessive hunting was responsible for the absence of *Bufo calamita* from Wisley to-day. While one hesitates to be dogmatic, it is almost certain that the Natterjack does not now occur within the 20-mile radius of the London Natural History Society.

Before leaving the question of distribution it is worthy of note that the careful recorder and naturalist, Gilbert White, in his *Natural History of Selborne*, makes no mention of the Natterjack, which was undoubtedly abundant in his district, and where it was seen by me last year. Writing to Thomas Pennant in 1768, White says:—" The reptiles, few as they are, I am not acquainted with so well as I could wish . . . . ," but in loyalty to the great observer one would prefer to read into this an innate modesty rather than a confession of ignorance. The omission is, however, the more strange in the light of Bell's statement—who also lived at Selborne—" the greatest number I have ever known is in my own garden at Selborne, where the species is far more frequent than the Common Toad."

Another important difference between our two native toads is evidenced by a comparison of their method of progression.

The Common Toad moves in a series of short hops and would seem to be incapable of traversing many yards without making a long pause;

indeed the very nature of its habitats—shady ditches and undergrowth—normally precludes the necessity for rapid travel. The Natterjack, on the contrary, raises its body on its short legs, and appears actually to run. It can travel as fast as a man walks, and here again we see the hand of Nature, for on the sandy tracts which are the Natterjack's haunts suitable cover is frequently scattered, and it is not difficult to believe that the power of swifter movement may be a very real factor in the preservation of the species.

Spawning takes place later in the year than with the other species of Batrachia, and usually occurs in May or early June in this country. It is at this period that the male utters his distinctive croak, a harsh vibrating monotone, and it is this action which produces the conspicuous distention of the sub-gular vocal sac. This reservoir of air becomes as large as the amphibian's head, and the human observer who witnesses this natural phenomenon for the first time cannot fail to marvel at such a provision of Nature, and to speculate upon the exact purpose fulfilled by the consequent intensifying of the toad's voice. At mating time also the inner, second, and third fingers of the male are adorned with pads of minute crenulated excrescences—sexual characteristics, which, in the Natterjack, frequently persist throughout the year.

The food of the Natterjack consists principally of crepuscular beetles, for which he seems to possess an unlimited capacity, though it is certain that any live food small enough will be snapped up. The essential factor is that potential prey must show movement; it is not enough merely to be alive. The writer has spent many hours studying the Natterjack's feeding habits in captivity and many interesting experiments can be made and much information gleaned which would be quite impossible with the batrachian when at large.

Fly grubs, worms, and caterpillars of smooth varieties it seizes with avidity, but hairy caterpillars and earwigs present difficulties. Snails are accepted if not too large, the crunching and internal disintegration of which can be heard intermittently for several minutes. The Natterjack is edentulous, and the normal process of mastication consists of crushing food between the tongue and roof of the mouth, this being accompanied by much serio-comic blinking of the eyes and shaking of the head. In my experience this toad is somewhat of a dainty feeder, and he will definitely reject the choicest morsel which has too many grains of sand or soil adhering to its body; or, if food in this condition be inadvertently seized, it will be promptly ejected with every manifestation of distaste.

Fast moving flies, spiders, and beetles are eagerly hunted, and then it is that the running powers of the Natterjack are used to good advantage. This form of prey also provokes to a maximum the peculiar drumming of the toes of the hind legs which occurs just before the toad seizes its victim. It may be described as a nerve reflex caused by the excitement of the chase. If a Natterjack be offered a wasp, the chances are about equal that the latter will be seized, and immediately rejected with every appearance of painful discomfort, or that it will be seized and swallowed in the ordinary way. In the former case it is interesting to observe that the toad has sufficient intelligence to avoid another wasp for days afterwards.

Though the Natterjack will snap up individual ants, he will exhibit great discomfort if a number be placed on his back, and will turn round in circles while attempting to dislodge them with his hind legs—an interesting instance of skin sensitiveness.

In connexion with the toad's feeding habits, it is worth putting on record observations of the creature's reactions when deprived of its expected prey by another toad. Most writers state that toads and frogs are in no way pugnacious, or capable of betraying anger, but I can definitely aver that if two Natterjacks are stalking the same worm, or fly, the unsuccessful hunter will almost invariably appear to snap at the head of the more fortunate toad, or even chase and similarly attack his flank. These are my observations based on a careful study of the phenomenon, and which I have frequently witnessed.

I am indebted to our President, Mr J. E. S. Dallas, for the delightful photograph of Natterjacks herewith reproduced, and the protective approximation of the toads' colouring and outline to the natural sand will be generally conceded.

The photograph shows on the left a female from Hampshire, and on the right a male from Norfolk. In both specimens the stud-like arrangement of the larger warts, the parotid gland behind the eye, and the yellow vertebral line are visible. The female, it will be noticed, is in the normal resting, or " quat " position, while the male, with forelegs raised, head erect, and eyes obviously alert, is so pivoted that he can glide away rapidly in any direction.

In common with other amphibians the Natterjack occasionally changes its skin. Even in captivity this process is not easy to observe, but one's patience may be rewarded by noticing a toad humping its back in a peculiar manner, and yawning prodigiously. These are infallible signs, and the outer layer of skin will be seen to shrink away from the body, and shrivel up. The process is often accelerated by friction of the legs, and the popular belief that toads eat their skin can certainly be confirmed to the extent that fragments of skin within reach of the forelegs are frequently pushed into the mouth and swallowed. The whole event may occupy half a day, and in my experience its occurrence seems to bear a definite relation to weather conditions.

The short rainy spells which usually recur during the summer months appear to be much favoured by all batrachians for this transformation, and one may deduce that a moist warm temperature externally, aided by a gland exudation internally, facilitates the shedding of the old skin. When the operation is completed the new skin glistens with unwonted lustre for several hours.

In conclusion, it may not be out of place to include a few notes on the Natterjack in captivity, and, if justification be needed, I would stress that this provides a means of recording accurate, minute, and sustained observations on the innumerable events of the toad's life cycle which would be difficult or impossible in the wild state.

Natterjacks should, ideally, be kept out of doors, in conditions which allow of good air circulation, with access to a small pool of water. They should be provided with sand, bark, and stone, under which to burrow, and their abode must be surrounded with some boundary of unclimbable material, such as glass or zinc. It must be remembered that this toad is an accomplished climber, but cannot jump, therefore a vertical obstacle of only a few inches will suffice to bar his progress, provided it is sufficiently smooth to prevent a foothold. Natural food is easily supplied in the form of small worms, flies and the "gentles" of the angler, and when these are difficult to obtain, the toads will no longer require them, for, at the approach of winter, they retire to their hiding places and become distinctly lethargic. A temporary mild spell, however, may lure them out, and, as I write these notes on January 1st, a temperature of 52° Fahr. has brought the Natterjacks out to prospect.

A system of controlled observation on the above lines gives scope for unlimited and original research into the habits of our native amphibians; and if, after a period of this fascinating study, the amateur herpetologist is able to replace his captives on their heathy moorland in as happy a condition as when he borrowed them, he may well feel that the time and care he has given to the Natterjack Toad has been well spent and richly rewarded.

Great Crested Grebe Report.

By P. A. D. Hollom.

IN 1935 the L.N.H.S. undertook to report on the number of Great Crested Grebes nesting in their area in connection with the counts which were being made in various parts of the country under the auspices of the British Trust for Ornithology. R. C. Homes was responsible for organising the area, and the following observers sent in records:—Miss C. M. Acland, C. H. Bentham, L. C. Collenette, L. M. Emberson, W. E. Glegg, P. A. D. Hollom, G. Hopkins, Miss P. H. Jeffery, Dr N. H. Joy, H. A. Littlejohn, B. Lloyd, Miss C. E. Longfield, Major A. Pam, L. Parmenter, R. W. Pethen, E. C. Rowberry, F. G. Swayne, B. T. Ward, C. Weeks, J. S. Wightman.

There is considerable change in the numbers and distribution of breeding pairs, compared with 1931, as reference to the detailed list of sites will show. 68 pairs were given as breeding in 1931, and about 42 pairs in 1935, a decrease of 26 pairs or 38%. If the Lea Valley group is taken as one locality, 22 waters were occupied in 1931; of these 6 were deserted in 1935, but 6 fresh localities were occupied, leaving the total unaltered. These changes have not been confined to any particular part of the society's area, but have been general throughout it.

As in 1931, the large Thames Valley reservoirs, where there are non-breeding birds throughout the summer, have not been taken into consideration, as counts for all of them are not available; moreover, the numbers of birds there fluctuate at times so greatly that to include them with the breeding population might lead to false conclusions.

It will be observed that the great decrease in nesting pairs, which fortunately has not been general throughout the country, has been accompanied by a corresponding increase in non-breeders, so that the total number of birds in the area (without considering the Thames Valley reservoirs) is practically the same this year as in 1931. This year there are as many non-breeders as breeding birds.

The decrease is difficult to account for. It was most marked at the Lea Valley reservoirs, where the drought had no noticeable effect in 1935, but in 1934 several nests were left stranded. Gatton also shows serious falling off, although the water level has remained without marked alteration since 1931. In that year six out of the nine pairs were accompanied by young, yet the following year apparently none nested, and there was only one pair in 1935.

The drought did not affect many breeding sites through changes in the water level. If the 13 Lea Valley reservoirs are again taken as one group, 30 waters have been occupied in the last five years, and this year it was repórted that the level of 21 of these was unaltered; that of 9 was reduced. At Feltham the lower level resulted in a great deal more cover springing up, so that the grebes had the most successful breeding season yet recorded for this water. At Colnbrook bye-pass and the two Penn Ponds the lower level did not affect the birds. One of the Stoke Newington reservoirs and Ivy Mill Pond, Godstone, were dried up in 1935, and at the remaining three waters (Navestock Lake, Elstree, and Ruislip) the drought is held to have been responsible for the absence of nests. Thus only five waters were adversely affected this year by the drought. In 1931 these five held 10 of the 68 pairs breeding in the area in that year.

Information for the years 1932, 1933, and 1934 is incomplete, but indicates that the population has been fluctuating. Fifteen waters were counted annually, and held 26, 17, 20, 17 and 19 pairs for the years 1931 to 1935 respectively. On this basis the numbers had decreased 27% since 1931, whereas over the whole area the decrease is 38%. Therefore, the fluctuations of these waters cannot be taken as representative of the whole.

The census brings out the increasing importance of gravel pits in the London area. In 1935, nine pits held 16 pairs (or 38% of the breeding population) and 30 non-breeding birds, while in 1931 only 6 pairs (or 9%) nested on gravel pits. Grebes nesting on gravel pits are easily overlooked, as the pits themselves are not marked on maps as are other sheets of water, but to overcome this difficulty Marquess Hachisuka very kindly took me up to make an aerial survey of the pits in N.W. Surrey and S.W. Middlesex early in the year.

Unfortunately in many cases gravel pits will provide only temporary accommodation for Grebes. After the gravel has been removed the pits are of value to their owners, firstly to be let out as rubbish dumps, and then to be sold as building sites. As the country round London becomes more built over, the demand for pits for both these purposes will increase.

	1935.			1931.			1932.	1933.	1934.
	Breeding Pairs.	Non-B. Birds.	Total Adults.	Breeding Pairs.	Non-B. Birds.	Total Adults.	Pairs.	Pairs.	Pairs.
BUCKINGHAMSHIRE.									
Colnbrook Bye-pass Gravel Pits ...	3	—	6	2	—	4	3	3	3
Rowley Lake, Black Park	1	—	2	—	—	—	1	1	1
ESSEX.									
Dagenham Breach	—	—	—	1	—	2	—	—	—
Eagle Pond, Snaresbrook	1	—	2	—	—	—	—	—	1
Lea Valley Reservoirs .... (13 reservoirs)	7	28	42 (June 22)	c24	30	78	—	—	—
Navestock Lake (Dudbrook Lake)	—	—	—	1	—	2	1	1	—
Thorndon Park	1	—	2	1	—	2	—	—	—
Sewardstone Gravel Pit	2	2	6	—	—	—	—	1	—
HERTFORDSHIRE.									
Cheshunt Reservoir	2	—	4	2	—	4	—	—	—
Elstree	—	4	4	3	—	6	3	2	2
Hamper Mill Gravel Pit	5	14	24 (June 23)	—	—	—	—	—	3
Wormley Bury	1	—	2	1	—	2	1	1	1
MIDDLESEX.									
Ashford Gravel Pit	1	—	2	—	—	—	—	—	—
Brent Reservoir	—	—	—	—	—	—	1	2	—
Feltham Gravel Pit	c4	—	c8	4	4	12	—	—	—
Gunnersbury Park	1	—	2	1	—	2	—	—	—
Hatton Gravel Pit	—	9	9 (June 20)	—	—	—	—	—	—
Osterley Park	3	—	6	2	—	4	1	2	2
Ruislip	—	14	14 (June 21)	4	—	8	—	—	5
Stoke Newington	1	4	6	3	1	7	—	—	4
Trent Park	—	—	—	1	—	2	—	—	—
SURREY.									
Beddington Gravel Pit	—	2	2	—	—	—	—	—	—
Gatton	1	—	2	9	—	18	—	2	3
Godstone, Bay Pond	1	—	2	1	—	2	1	1	1
Ivy Mill	—	—	—	—	—	—	1	—	—
Mitcham Junction Gravel Pit	1	—	2	—	—	—	—	—	—
Penn Ponds, Richmond Park	2	—	4	3	—	6	2	2	2
Silvermere, Cobham	1	—	2	1	—	2	1	1	1
South Norwood	1	—	2	—	—	—	—	—	—
Walton-on-Thames Gravel Pit	—	3	3 (June 15)	—	—	—	—	—	—
Weybridge Mill Pond	1	—	2	1	—	2	1	1	1
Weybridge Seven Arches	1	—	2	1	—	2	1	1	1
Wimbledon	—	4	4	2	—	4	—	—	—
Totals	42	84	168	68	35	171			

An Identification Key to British Grey Geese.

By John Berry.

GENERAL NOTES ON GREY GEESE (Genus: *Anser*).

Size: Although often a helpful guide to identification, size can never be relied upon as a distinguishing character, since in this respect all the British grey geese overlap.

Plumage: Plumage is the safest basis of identification, but there is considerable variation throughout life. Young birds in first plumage have the feathers of the upper surface narrower and sharper than in adults, while feathers on the lower surface are less than three-fifths the widths of corresponding adult feathers. They are also less clearly marked.

In geese of the second and third years plumage is of adult type, but darker than in fully adult specimens.

There is a slight seasonal variation in plumage. During autumn and winter it is decidedly greyer than in summer. This is most marked in the case of the Pink-footed Goose (*A. brachyrhynchus*), in which the grey characteristic of autumn and winter becomes rapidly browner during May. Before moult these geese may be quite rufous, especially on the back.

When examining museum specimens it must be recollected that preserved skins have usually undergone considerable fading.

Colour of soft-parts: In living or freshly-killed geese soft-part colouration is an important aid to identification. There are, however, occasional rare variations, usually pathological.†

Nail and claws: The black nail characteristic of the Bean geese is constant throughout life, and varieties with a white or parti-coloured nail are extremely rare. The white nail characteristic of the Greylag and White-fronted geese is much less constant; immatures usually have a dark horn-coloured, or black nail which may never turn completely white. Parti-coloured nails are not uncommon, especially in the greater white-fronted goose. The white or yellowish nail of the snow geese seems to be much more constant, and parti-coloured nails in the genus *Hyperboreus* are exceedingly rare.

The colour of the claws of geese is highly variable. Not only may a goose have black and white claws on the same foot, but the colour of an individual claw may change completely during life.

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†For information on the biochemical problems of xanthophyl pigmentation the recent papers of Professor E. Lönnberg and Dr Völker should be consulted. Proc. viiith Internat. Ornith. Congress, 1934, etc.

Greylag (*Anser anser* L.).

Head, neck, and anterior back grey-brown; scapulars greyish. Main wing-coverts, posterior back and rump ash-grey; upper lesser wing-coverts, carpal, winglet, primary-coverts and primaries of the basal quarter very light ash-grey; middle and greater wing-coverts, secondaries and tertiaries brown. Under wing-coverts and axillaries light ashen grey. Upper tail-coverts white. Tail normally of 18 feathers—outer pair white on each side, the rest greyish-brown with white outer margins.

Fore-neck, breast and abdomen light greyish-brown, fading into white posteriorly. The breast is usually spotted with black, sometimes so heavily blotched as to appear completely black when in flight. This black feathering is slight or absent in immature birds, but its extent is independent of age, sex, race or feeding, although very black breasts are usually characteristic of old males. Generally speaking, the black feathers do increase with age and also during each season, but this is not constant.

Bill orange with a white or brownish nail; sometimes a narrow band of white feathering at the base of the bill. Legs pink or flesh-coloured, but greyish in immatures as in all young geese.

Chief distinctive characters: The white nail, pink legs (c.f. yellow or orange legs of White-fronted geese), and black feathers on the breast (never found in Bean or Pink-footed geese); but particularly the grey "shoulders" which are also conspicuous in flight.

Dimensions: Total length, 740-890 mm. Wing, 400-480 mm. Tarsus, 65-80 mm. Bill, Culmen, 55-70 mm. Depth,* about ½ culmen. Nail, 13-20 mm. Teeth, 18-24 (usually 21-22). Weight fairly constant about 8 lbs.

Sub-species: *A. a. rubirostris* Swinhoe. Status doubtful. The Eastern Greylag is larger than the western race, and has paler plumage. It stands very erect, and the relatively larger and thicker bill is striking. Colour of bill, bright rose-red to carmine. Voice of a large flock sounds deeper than that of western flocks.

White-fronted goose (*Anser albifrons albifrons* Scop.).

Head and neck brown, cheeks and throat lighter than crown and nape. Forehead and feathers round base of bill white, except in very young birds. The breadth of this white "front" is variable and independent of age or sex, but it rarely if ever extends further back than a line joining the anterior angles of the eyes. (c.f. *A. erythropus.*) Back, scapulars and tertiaries brown; rump dark grey-brown; wing-coverts greyish-brown, greater wing-coverts edged with white, which forms a conspicuous bar; primaries bluish, secondaries almost black. Axillaries dark grey-brown. Tail feathers normally 16, greyish-brown edged and tipped with white. Sides and flanks brown. Breast brownish, paling into white posteriorly. Except in very young birds there is a variable degree of black feathering on the breast and belly.

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*Measured vertically from the angle of the mouth to the upper angle of the bill in front of the eye.

This takes the form of bars rather than spots as in the Greylag, and, while not directly dependent on age, may render the underparts almost completely black, especially in old ganders.

Bill pale pink to rich rose-red with a longitudinal median streak of yellow on the culmen, and along the rami of the lower mandible; nail, white. Immature birds have a greyish-yellow bill and a dark nail. Legs and feet orange-yellow. Ceroma (eye-lid) grey varying to brown. (c.f. *A. erythropus*, q.v.)

Chief distinctive characters: The black breast feathers and white "front" distinguish it from the Black-nailed geese. Browner plumage and orange legs help to distinguish it from the Greylag, while the colour of the ceroma and the shape of the white frontal band separate it from the lesser White-fronted Goose. The shrill "laughing" call is also typical.

Dimensions (of British birds): Total length, 620-750 mm. Wing, 380-450 mm. Tarsus, 55-80 mm. Bill, Culmen, 40-55 mm. Depth, less than ½ culmen. Nail, 8-14 mm. Teeth, 22-29. Weight variable, about 5 lbs.

Sub-species: There appears to be a gradual decrease in average size from the large western American *A. a. gambeli* through the Greenland race (occurring also in Iceland, West Scotland, etc.) to the small race which winters in Central Southern Europe. Eastwards size increases to a large race inhabiting north-eastern Asia. I know of no reliable means of identifying individuals of these several races.

LESSER WHITE-FRONTED GOOSE (*Anser erythropus* L.).

Plumage much resembling that of *A. albifrons*, but head, neck and back more chocolate-coloured, and considerably darker. The inner primaries and outer secondaries are entirely dark brown, so that a conspicuous dark brown "speculum" is formed when the wing is closed. The under wing-feathers and axillaries are so dark grey as to seem almost black in some specimens.

This species can be distinguished from the greater White-fronted Goose at all ages by the colour of the ceroma (eye-lids), which is bright lemon-yellow. Adults may also be recognised by the shape of the white frontal band which extends on to the top of the head between the eyes.

Chief distinctive characters: The colour of the swollen, ring-like eye-lids is the safest test, also the shape of the white front in fully adult birds. In the field it is useful to note that at rest the wing-tips project beyond the tail, which is not the case in *albifrons*. Although averaging considerably smaller than *A. albifrons*, it is seldom that *A. erythropus* can be distinguished by size alone, since at least in Hungary these two species overlap in this respect.

Dimensions: Total length, 520-650 mm. Wing, 340-390 mm. Tarsus, 50-65 mm. Bill, Culmen, 30-45 mm. Depth, less than ½ culmen. Nail, ?? 5-10 mm. Teeth, about 22. Weight, about 3¾ lbs. (very variable).

Sub-species: None noticed.

GENERAL NOTE ON BLACK-NAILED GEESE.

The Black-nailed, or "Bean," geese form a separate group for which Dr S. A. Buturlin established a new sub-genus *Melanonyx* in 1901. There are some seven distinct species, and an unknown number of geographical races or sub-species about which there is still considerable uncertainty. The present status of all the members of the group, therefore, must be considered subject to confirmation following further investigation.

Plumage conforms in general to that of the White-nailed geese, but black feathers are absent from the breast. Identification of these geese at present is based chiefly upon the colour of the soft-parts, and the shape and dimensions of the bills. As has been mentioned above, soft-part colour, although not absolutely certain, is on the whole a reliable basis for identification. The bills of Bean-geese have a glossy, jet-black nail, the relative size of which seems remarkably constant. Behind the nail the bill is encircled by a reddish or orange band of variable extent, while the basal half of the bill is usually black. The number of the lamellae or "teeth" increases slightly through life, and is variable, but although their number is not an accurate means of determination, often it provides a helpful indication.

Pink-footed or Short-billed Bean Goose (*Anser brachyrhynchus* Baillon).

The most numerous goose in Britain, although probably one of the rarest species in the world as a whole, the Pink-footed is the most distinct member of the genus. The head and neck are very dark coffee-coloured, almost black in young birds. Base of neck russet, merging into grey-brown or slate-grey of scapulars and flanks, these feathers being broadly edged with grey or white. Main wing-coverts dark grey-brown, or slate-grey broadly tipped with white. Lesser wing-coverts, primary-coverts, outer primaries and rump ashy-grey or blue-grey; inner primaries, secondaries and tertiaries becoming darker and browner towards the body; under wing-coverts and axillaries grey. Tail of 16-18 feathers, very dark brownish-grey with broad white margins. Breast rufous-brown, paling into white posteriorly.

The so-called "pie-bald geese" obtained on autumn migration are cases of delayed moult in which old brown summer feathers and new grey winter feathers overlap. I saw a flock in South-west Iceland in late August all of which presented a remarkably spotted appearance for this reason.

The bill is relatively short, heavy, and coloured black with an area of pink behind the nail. The bill may be entirely black (rare) or entirely pink (less rare), but usually it is black except for an irregular band of pink extending back along the tomia. The colouration of the bill is completely independent of age, for the extent of pink may increase or decrease in successive seasons. Legs and feet are bright pink, but the depth of colour appears to vary with health and nutrition.

Chief distinctive characters: Usually easy to recognise by the contrast between the very dark head and neck, and the pale body. The plump, rounded head and short bill are also easily noticed. Leg-colour is important, but it is difficult to observe in wild flocks, and changes rapidly after death. The shrill "wink-wink" of a gander is peculiar to this species, and once learnt is not easily forgotten.

Dimensions: Total length, 550-770 mm. Wing, 410-465 mm. Tarsus, 53-75 mm. Bill, Culmen, 40-55 mm. Depth more than ½ culmen. Nail, 11-16 mm. Teeth, 20-22 (very constant). Weight, 2¼-8½ lbs.; average, 6 lbs.

Sub-species: The Icelandic and East Greenland race is said to be larger and darker than the Spitzbergen race, but data are still insufficient for the point to be settled.

WESTERN BEAN GOOSE (*Anser segetum* Buturlin 1902; Alphéraky 1904; etc. = *Anser fabalis segetum* Grote 1904 = *Anser serrirostris rossicus* Buturlin 1933).

Note: The nomenclature of the yellow-legged Bean geese is at present in a state of uncertainty. Two distinct types occur in Britain, the Western Bean Goose and the Yellow-billed Goose. As far as is at present known, the former is essentially a tundra-breeding bird nesting in the far north, especially in Novaya Zemlya. The Yellow-billed Goose, on the other hand, is known to nest in the swamp-scrub of Central Finland. It appears to be the commoner species in Britain.

The Western Bean Goose is the darkest of the grey geese, and in the field appears almost black. Head and neck brownish-grey; back dark grey; rump almost black. Scapulars dark brown edged with grey; lesser wing-coverts grey brown, greater and median wing-coverts black-brown edged with greyish-white. Flight-feathers dark grey, merging into blackish-brown. Whole of underside of wing and axillaries dark slate-grey. Tail of 18-20 feathers, dark grey-brown with broad white tips. Breast feathers grey with paler edges.

Legs and feet orange. Bill seldom if ever bordered by more than a few white plumules at its base. In shape the bill is relatively narrow, and the culmen is not more than three and a half times the length of the nail, which is markedly elongated. Behind the nail is a narrow band of orange, rarely extending back below the nares, and which does not appear to alter perceptibly during life. (c.f. *A. brachyrhynchus*.)

Chief distinctive characters: In the field the Western Bean often can be recognised by its very dark plumage, long neck, and elongated head, and in general by its erect carriage and slender body. From the Pink-footed Goose it is distinguished by the orange legs and dark rump, and from the Yellow-billed Goose (q.v.) by the greyer plumage, absence of a white frontal band, and by the fact that the culmen is not more than three and a half times the length of the oval nail.

Dimensions: Data insufficient to be fully representative. Total length, 600-800 mm. Wing, 450-480 mm. Tarsus, 70-80 mm. Bill, Culmen, 45-60 mm. (normally 52-54 mm. and depth 23 mm.). Nail, 15-20 mm. Teeth, 20-25 (usually 23). Weight, about 7½ lbs.

Sub-species: There are several so-called sub-species, chiefly distinguished by larger size and a relatively longer bill. Most of these are

Asiatic and have not been recorded in Britain, but it is desirable that all exceptionally large Bean geese should be referred to expert opinion.

YELLOW-BILLED GOOSE (*Anser arvensis* Brehm 1830; etc. = *Anser fabalis arvensis* many authors. = *Anser fabalis fabalis* Buturlin 1933; Grote 1934; and ?Latham 1787).

A squatter and plumper bird than the Western Bean Goose, with a relatively shorter neck, more rounded head, and larger bill. Head and neck greyish-brown with a faint reddish tinge. Base of bill usually encircled by a white frontal band, occasionally as much as 15 mm. in breadth. This white feathering is very variable, it is absent in immatures and may be lost in old age. Back and scapulars dark-brown edged with buff, forming a wavy effect; wing-coverts similar, except near margin of wing, where they are ashy-grey. Wing brown, shading into grey primary-coverts. Flight-feathers dark-brown to grey. Rump brownish-black; tail-feathers 18-20, brownish-black with broad white tips. Breast buff, paling into white. Axillaries sooty-brown or grey.

Legs and feet yellowish-orange. Bill relatively broad and strong; culmen not less than three and a half times the nail, which is almost circular. (Culmen is usually 4-4½ times the nail.) In colour the bill is variable. Except for the glossy black nail, it may be completely orange-yellow, or with a black line on the culmen and along the lower jaw. In young birds the extent of black may be almost that in the Western Bean Goose.

Chief distinctive characters: The relatively short neck, rounded head, heavy bill, and plump body are a helpful guide in the field. The dark brown plumage distinguishes it from the Greylag, while the heavy orange bill should prevent confusion with the White-fronted. From the Western Bean it can be separated definitely only by measurement of the culmen and nail, and by the greater number of teeth.

Dimensions: Total length, 750-900 mm. Wing, 420-540 mm. Tarsus, 70-85 mm. Bill, Culmen, 55-70 mm. = 2½ × Depth. Nail, 15-20 mm. Teeth, 24-30 (normally 26). Weight, about 8½ lbs.

Sub-species: Many different races have been described, but their validity calls for much further investigation.

Although not yet accepted for the British List, two other members of this group may occur in the British Isles not infrequently, and therefore should be mentioned here.

SUSHKIN'S GOOSE (*Anser neglectus* Sush.).

Sushkin's goose is a large species closely resembling the Yellow-billed Goose in plumage. The bill is remarkably slender although relatively long; the band is pink or carmine, and almost as variable in extent as in *A. brachyrhynchus*.

Chief distinguishing characters: The pink legs, feet, and bill prevent confusion with the *segetum* and *arvensis* types, from which it is also distinguished by the slenderness of the bill. From the Pink-footed Goose it can be known by the black rump, and by the dark-brown instead of ashy-grey secondary-coverts. Most specimens are decidedly larger than any normal Pink-footed Goose.

Dimensions: Total length, 700 (immature)-850 mm. Wing, 440-560 mm. Tarsus, 72-84 mm. Bill, Culmen, 51-65 mm. (usually about 60 mm.). Depth, 18-26 mm. Nail, 14-17 mm. Teeth, 19-30 (very variable). Weight, ? 7-10 lbs.

BUTURLIN'S GOOSE (*Anser carneirostris* But.).

Little is known of this supposed species. The few specimens which I have examined certainly seemed different from any other members of the genus. They were obtained in Hungary. The general colour was fawn-grey; head and back of neck brown; rump dark grey-brown. Wings resembling those of *A. brachyrhynchus*, but having the secondary-coverts brownish as in *A. neglectus*. Underparts from mid-breast to tail white.

Legs and feet lemon-yellow or orange; bill very slender, black with a carmine band. In one specimen the bill was entirely carmine except the nail.

Chief distinguishing characters: Small size, but more slender bill than in *A. brachyrhynchus*, from which it is distinguished by the dark brownish-black rump, and yellow or orange legs.

Dimensions: Data insufficient. Total length, 610-710 mm. Wing, 400-450 mm. Tarsus, ? 65-75 mm. Bill, Culmen, 43-55 mm. Depth, 17-23 mm. Nail, 13-15 mm. Teeth, 18-26 (small and difficult to count). Weight, ?? 5-7 lbs.

Bird Ringing, 1935.

By R. W. HALE.

THE Society's returns under the *British Birds* Marking Scheme for the year show a considerable decrease on the unusually high figures for 1934. 482 birds of 30 species were ringed by our members, and this compares with 1336 birds of 46 species in 1934. The reduction is largely accounted for by the fact that one ringer, who ringed 732 birds in 1934, can no longer devote so much time to trapping adults. The following table shows the results of the eleven ringers who took part in the work:—

Name of Ringer.	Nestlings.	Trapped.	Total.
Stuart Boardman	14	10	24
M. V. Boys	3	57	60
G. A. Buckland	5	—	5
H. J. Burkill	1	—	1
C. L. Collenette	—	80	80
R. C. Homes	1	—	1
R. M. Jones	262	10	272
H.M. Office of Works	—	3	3
J. E. Sulman	3	21	24
G. Waller	—	9	9
B. T. Ward	3	—	3
	292	190	482
1934 figures	380	956	1336

The most numerous species ringed were as follows:—

Swallow	122	Blue Tit	48
Song Thrush	95	Blackbird	28
Starling	69	Jackdaw	24

We welcome one new ringer, Mr G. A. Buckland. The Bird Ringing Secretary—R. W. Hale, 6 Grendon Gardens, Barn Hill, Wembley Park, Middlesex—will be pleased to hear from any member who would like to take up ringing. There is a charge of 9d for each packet of twenty rings.

RECOVERIES OF RINGED BIRDS.

Birds of the following species are now omitted from the recoveries published in *British Birds* when ringed as adults and recovered where ringed, except in cases of exceptional interest, such as long life or "homing":—Starling, Greenfinch, Chaffinch, Yellowhammer, Song Thrush, Blackbird, Robin, and Hedge Sparrow.

The following recoveries of birds ringed by our members have been reported in *British Birds* since the last list was compiled:—

STARLING. *Sturnus v. vulgaris* L.

Three adults ringed at Friern Barnet (Middlesex) by M. V. Boys:—

1. FR646, ringed 30/10/34, recovered 13/12/34 at Bishop's Stortford (Herts) by V. Trindall.
2. FK606, ringed 28/10/33, recovered in February 1935 at Amersfoort, Utrecht, Holland, by J. Bijl.
3. FN801, ringed 20/1/34, recovered 30/5/35 at Epping (Essex) by C. Nicholls.

BLACKBIRD. *Turdus m. merula.*

4. CF536, ringed 18/5/33 as a nestling at Barn Elms Reservoirs (Surrey) by E. G. Pedler, recovered where ringed 12/1/35.

SWALLOW. *Hirundo r. rustica.*

Recovered where ringed:—

5. MA886, ringed 13/6/33 as a nestling at Fosse Bridge (Gloster) by S. Boardman, recovered in July 1935.

Two adults ringed at Fulbourne (Cambs) by R. M. Jones:—

6. MA926, ringed 22/5/34, recovered 5/6/35.
7. MA936, ringed 22/5/34, recovered 5/6/35.

This is a remarkable recovery, as the two birds were mates in both years.

BLACK-HEADED GULL. *Larus r. ridibundus.*

8. RR8073, ringed 25/2/34 as an adult at Friern Barnet (Middlesex) by M. V. Boys, recovered 22/1/35 at Norresundby, Jylland, Denmark, by C. C. Anderson.

Birds in the London Area, 1935.

BIRDS OBSERVED WITHIN TWENTY MILES OF ST PAUL'S CATHEDRAL.

Selected and Arranged by the Ornithological Records Committee (C. S. Bayne, R. C. Homes, L. Parmenter, C. Weeks).

CHOICE of the most interesting occurrences of the year is always difficult, but the following may perhaps be mentioned:—The breeding of Cirl Bunting, a Dartford Warbler on Wimbledon Common, the first Bewick's Swan for Middlesex, the recording of Shags in five places within a few days in February, Slavonian and Red-necked Grebe in the Lea Valley, Great Northern Diver at Molesey, Stone Curlew in Richmond Park, the autumn passage of four species of Terns including Arctic, and Arctic Skua in St James's Park. The stay of a Grey Phalarope for as long as eight days appears to have synchronised almost exactly with a special source of food-supply. Surrey has had a large share of the Crossbill immigration, parties being seen in many localities. The continued occurrence of waders on passage at Ruislip Reservoir is of great interest, as until recently few had been seen there. There is a welcome increase in the reports of Nightjars in the area.

The appeal for special information on the Redstart, Great Spotted Woodpecker and Pochard has met with a fairly good response, but members are requested to make reports on special species separately on the lines suggested in the circular sent to all recorders. The species chosen for 1936 are the *Lesser Redpoll*, *Grey Wagtail* and *Little Owl*.

All records are for 1935 except in the report on the special species and where otherwise stated. Observers responsible for the published notes are indicated by initials, as are the counties. Abbreviations used are as follows:—*B.B.*=*British Birds* Magazine, *L.N.*=*London Naturalist*, Res.=Reservoir.

The Committee wish to thank Mr E. G. Pedler for his assistance in searching the *Field* and *Country Life* for records. Their thanks are also due to the following 77 observers, whose willing co-operation makes the report possible.

Miss C. M. Acland.
K. R. Ashby, per R.C.H.
Miss J. Baggallay.
W. Baggaley.
H. Bentham.
A. H. Bishop, per C.L.C.
H. J. Burkill.
Dr J. S. Carter.
S. A. Chambers, per L. P.
K. R. Chandler, per R.C.H.
W. C. Cocksedge.
C. L. Collenette.
G. W. Collett.
J. D. Daffarn.
Miss K. Douglas-Smith.
W. H. Dunkin.
J. C. Eales-White.
L. M. Emberson.
F. R. Finch.
R. S. R. Fitter.
H. Gaster.
E. H. Gillham.
W. E. Glegg.
D. Gunn, per A.H.M.
N. G. Hadden, per F.R.F.
R. W. Hale (R.W.He.).

P. J. Hanson.
J. P. Hardiman.
A. H. Harris, per C.W.
P. H. T. Hartley, per R.C.H.
R. W. Hayman (R.W.Hn.).
P. D. Hayward.
R. Hickman, per G.E.M.
P. A. D. Hollom, per L.P.
R. C. Homes.
G. Hopkins.
A. B. Hornblower.
Miss M. M. Hose.
F. House.
Miss P. H. Jeffery.
F. J. Johnston.
Mrs H. M. Rait-Kerr.
K. P. Keywood, per R.C.H.
M. D. Lister, per R.C.H.
Miss C. E. Longfield.
Dr G. Carmichael Low.
A. Holte Macpherson.
E. Mann.
F. R. Mann.
G. E. Manser.
D. A. T. Morgan.
E. M. Nicholls, per R.C.H. (E.M.Ns.).
E. M. Nicholson (E.M.Nn.).
E. T. Nicholson.
C. A. Norris.
L. Parmenter.
C. W. G. Paulson.
E. G. Pedler.
R. W. Pethen.
H. A. Pettitt.
A. J. Rabbets, per G.E.M
P. W. Ratcliff.
Miss M. Rew.
J. E. Roberts.
J. Ross.
E. C. Rowberry.
J. A. Simes.
D. Seth-Smith.
R. McKenzie Smith.
Dr F. G. Swayne.
Miss M. S. Van Oostveen.
B. T. Ward.
Mrs W. Boyd-Watt.
C. Weeks.
J. S. Wightman.
R. E. Windsor, per C.L.C.
W. A. Wright.

HOODED CROW. *Corvus c. cornix* L.

E. King George V Reservoir, Chingford, one nearby on 9th November (E.M.). Roding Valley, one at Chigwell on 20th January (R.McK.S), one between Theydon Garnon and Abridge on 6th April (J.A.S.), and one near Buckhurst Hill on 1st December (E.T.N., W.A.W.).

H. Watford sewage farm, one from beginning of January to 3rd February (G.H.).

K. Elmers End sewage farm, one from 6th January to 17th February, two on 31st March (G.E.M., P.W.R., F.G.S.), and one on 8th December (G.E.M.).

M. Bushy Park, one seen on several occasions, winter 1934-5 (J.E.R.). Staines Res., one on 5th and 10th, two on 22nd January (A.H.M.), one on 2nd (N.G.H.) and 17th (G.C.L.). and two on 24th February, and 5th March (A.H.M.).

S. Beddington sewage farm, one to three from 2nd November 1934 to 2nd May (S.A.C., L.P., P.W.R.). Epsom sewage farm, one from 30th March to 6th April (R.S.R.F., R.C.H., J.S.W.).

HAWFINCH. *Coccothraustes c. coccothraustes* (L.).

E. Epping Forest, considered quite scarce in the Chingford district (J.R.), but increasing around Loughton (P.D.H.). Knighton Wood, one on 19th (B.T.W.) and 21st April (W.A.W.). Navestock, one on 17th March (R.McK.S., B.T.W.) and on 28th April (B.T.W.). Woodford Green, one on 12th May (B.T.W., W.A.W.).

K. Beckenham, two pairs on 30th April (P.W.R.). Dulwich, one on 7th April (W.H.D.).

M. Bushy Park, one on 8th December (J.E.R.). Northwood, a pair in old gravel pits on 2nd February stayed until the end of June and probably nested. A third bird was with them on 16th March (G.H.). White Webbs Wood, five to six pairs resident (E.M.Ns.).

S. Addlestone, three on 28th March, a pair building on 4th May (P.A.D.H.). Banstead, two on 15th May (C.M.A., J.E.R.). Bookham Common, two on 19th April (L.P.). Limpsfield, a pair on 24th March, uncommon here, no nest found (K.R.C.). Oxshott Heath, six among the pines on 17th August (K.P.K.). Oxted, two on 3rd January (K.R.C.). Petersham Park, two on 6th March (G.C.L.). Reigate, two on 9th March, seven on 6th April (H.B.) and one on 22nd December (G.W.C.). Richmond Park, two on 22nd March (A.H.M.) and two on 13th April (G.C.L.). Tadworth, one to three seen January to end of September, but not during May and August (H.B.). Walton Heath, three on 4th and one on 12th May (H.B.). Wimbledon Common, usually one or two during March (J.B.).

Siskin. *Carduelis spinus* (L.).

E. Epping Forest, 50-60 feeding on birch catkins on 29th January and 12 on 9th February (F.J.J.).

K. Beckenham, up to 7 in March and December (P.W.R.).

M. Bushy Park, 12 on 30th October (J.E.R.). Near Denham, a small party on 23rd February and near Uxbridge on 8th January (F.R.F.). Highgate Woods, one on 15th April (J.D.D.). Staines Res., two on 26th February (J.E.R.).

S. Arbrook Common, flocks of 50 on several occasions (A.H.H.). Crohamhurst, three on 7th April (C.E.L.). Epsom, seen on 6th October (M.D.L.). Esher Common, 100 on 24th February and a few on 24th March (J.S.W.). Ewell, 50 on 8th April and several flocks of ten and under in December (A.H.H.). Ham Common, two on 30th December (F.R.M.). Ockham Common, seen on 29th November (G.W.C.). Richmond Park, four on 19th March (C.L.C.). Wimbledon Common, three on 11th February, 200 on 8th March (A.H.M.), seen on 5th and 15th March, 24 to 36 on 17th March and one on 1st May (R.E.W.).

Lesser Redpoll. *Carduelis flammea cabaret* (P. L. S. Müll.).

E. Epping Forest, about 100 were seen roosting in rhododendrons on 14th February, and between 100 and 150 on 3rd March (F.J.J.). 24 in Strawberry Hill plantation on 19th April (B.T.W.). Small parties were also observed at Buckhurst Hill, Chingford, Knighton Wood, Lords Bushes and Sewardstone.

H. Croxley Green Moor, 7 to 8 on 10th March. Moor Park, 5 or 6 on 5th May (G.H.).

K. Hayes Common, large flocks in March and early April. A few pairs during summer, one nest being found. Keston, a pair, possibly nested (G.E.M., P.W.R.).

M. Northwood, nested. Ruislip, a flock of 30-50 in Park Wood on 2nd and 16th March and a pair on 13th April (G.H.). Near Uxbridge, a small party on 27th December (F.R.F.). White Webbs Wood, scarcer in winter 1934-5 than in previous winter (E.M.Ns.).

S. Arbrook Common, over 30 on 3rd February (R.C.H.). Ashtead, almost certainly nested (J.S.W.). Crohamhurst, 30-40 on 7th April (C.E.L.). Limpsfield, nested (K.R.C.). Oxshott, plentiful in winter, but less common than in 1934 (A.H.H.). Sutton, probably bred (P.H.T.H.). Walton Heath, 70 on 12th January, 12 pairs on 4th May (H.B.). Wimbledon, plentiful in winter (J.B.), nested (R.E.W.).

COMMON CROSSBILL. *Loxia c. curvirostra* L.

K. Hayes and Keston, up to twenty from 22nd September to 11th November (R.H., G.E.M., P.W.R.).

S. Addlestone, two on 9th November (P.A.D.H. and W. K. Robinson in *B.B.*, xxix, p. 253). Ashtead, one on 13th and a small flock on 18th October (J.S.W.). Carshalton, small parties from 22nd September, five during October (P.H.T.H.), six on 22nd October (S.A.C.). Coulsdon, more than 20 in early October (B. D. Moreton in *op. cit.*, p. 175). Esher, two on 8th July (H. G. Attlee in *op. cit.*, p. 175), two or three on 7th September (J.S.W.). Limpsfield, three on 30th November (K.R.C.). Mickleham, five on 24th November (P.A.D.H. and W. K. Robinson in *op. cit.*, p. 253). Ockham Common. one seen and others heard on 26th July (R. M. Lockley in *op. cit.*, p. 112). Oxshott, seven on 24th June (H. G. Attlee in *op. cit.*, p. 148), four on 12th October (R.C.H., J.S.W.), about 10 on 13th October (G.W.C.). Reigate, small parties in September (H. G. Alexander in *op. cit.*, p. 175). Richmond Park, a pair on 2nd October (M.S.V.O.), a pair on 10th November increased to 5 or 6, birds remained for over a week (C.L.C.), one on 17th December (R.E.W.). Shirley, seen on 5th and 21st October (A.J.R., P.W.R.). Tadworth, about twelve from 30th June until 13th October (H.B.). Wimbledon Common, one on 3rd December (R.E.W.).

CHAFFINCH. *Fringilla c. coelebs* L.

M. Bushy Park, a "tremendous influx" about 18th February as in 1934 (J.E.R.).

BRAMBLING. *Fringilla montifringilla* L.

E. Epping Forest, well distributed winter 1934-5 (B.T.W.), either spreading or increasing in February (J.R.). On 9th February, 20-30 feeding on beech-mast, on 29th February and 29th March 50-60 feeding under hornbeams (F.J.J., see also *L.N.*, 1934, p. 122). Monks Wood, flock of 60 on 13th March (J.A.S.). Walthamstow Res., four on 2nd March (R.McK.S.).

H. Watford sewage farm, a few from 3rd February until 7th April, but less than in 1934 (G.H.).

K. Beckenham, one on 16th April and 10th November. Elmers End sewage farm, up to 12 seen January to early April, 7 on 10th and 13th November (P.W.R., F.G.S.).

M. Bushy Park, several on 12th November (J.E.R.). Hampstead Heath, several on 5th February (K.D.-S.). Kensington Gardens, one near Long Water on 29th March (G.C.L., E.G.P.). Staines Res., seen on 3rd (F.R.F.), 10th and 24th February (F.R.F., G.C.L.). West Drayton, over 50 on 24th February (J.E.R.).

S. Arbrook Common, several 3rd February (R.C.H.). Ashtead, up to 8 from January to early April (R.C.H., J.S.W.), flocks of 12 or more seen early part of year (A.H.H.). Beddington, 30-40 on 23rd January (S.A.C.), seen February to early April, 109 on 10th and 400 on 31st March (L.P.), 60-80 on 10th and 11th April (P.W.R.). Botley Hill, several on 3rd January (K.R.C.). Carshalton, 300-400 on 12th January, and hundreds feeding on beech-mast on 9th February (S.A.C.). Crohamhurst, a male on 7th April (C.E.L.). Epsom Downs, 10 on 13th April (J.S.W.). Epsom sewage farm, five or six on 16th March and 6th April (R.S.R.F., R.C.H.). Esher Common, six on 24th March (J.S.W.). Headley, six on 10th March (R.C.H., J.S.W.). Kingswood, 7 on 6th, 50 on 19th January and 2 on 9th February (H.B.). Limpsfield, a few on 3rd March (K.R.C.). Mickleham, 20 on 12th January (R.S.R.F., R.C.H.), large flocks in January and February (A.H.H.). Oxshott, 30 to 40 on 3rd February (R.C.H.). Reigate, one on 6th April (H.B.). Richmond Park, small numbers in early part of year; few autumn records, but seen in October and November (C.L.C.), 100 on 28th January (W.E.G., R.E.W.), 30 on 31st January and 20 on 9th February (A.H.M.). Tadworth, 4 on 3rd February and 6 on 16th March (H.B.). Warlingham, several on 23rd March (K.R.C.). Walton Heath, 18 on 9th February, 5 on 2nd March (H.B.). Wimbledon, seen during March (J.B., F.R.F.).

TREE SPARROW. *Passer m. montanus* (L.).

E. Epping Forest, observed regularly and breeding in several places.

H. Colne Valley, bred near Sandy Lodge and at Hamper Mill (G.H.).

K. Elmers End sewage farm, 40-60 January to March, 40-80 end October to December (G.E.M., P.W.R.).

M. Bushy Park, a few on 12th November. Hampton Court Park, 6 on 18th November (J.E.R.).

S. Beddington sewage farm, about 40 birds resident, 228 counted on 3rd February, 240 on 3rd and 178 on 10th March (L.P.). Epsom sewage farm, 70 on 30th March (J.S.W.). Richmond Park, nested in usual numbers (C.L.C.), 70 on 26th April (J.C.E.-W.).

CORN BUNTING. *Emberiza c. calandra* L.

S. Beddington sewage farm, one to two males singing from 29th March to 2nd May (G.W.C., L.P., P.W.R.). Cuddington Downs, one during February to April, two on 24th February (R.S.R.F.). Ewell, five to six pairs probably bred, last seen on 17th October (A.H.H.).

CIRL BUNTING. *Emberiza c. cirlus* L.
K. Biggin Hill, nested (E.H.G., R.H., G.E.M., P.W.R.).
S. Oxshott, a male on 5th May (L.P.), Sutton, a male on 23rd October (P.H.T.H.).

SNOW BUNTING. *Plectrophenax n. nivalis* (L.).
M. Kensington Gardens, one by the Round Pond on 26th November (G.C.L., E.G.P., see also *B.B.*, xxix, 239).

WOOD LARK. *Lullula a. arborea* (L.).
S. Oxshott Heath, male in song on 5th May (L.P.). Richmond Park, a pair nested (A.H.B.).

ROCK PIPIT. *Anthus spinoletta petrosus* (Mont.).
E. King George V Res., one on 26th October (W.A.W.). Walthamstow Res., one on 22nd December (H.A.P., E.T.N.).
H. Hamper Mill, one on 20th August (G.H.).

YELLOW WAGTAIL. *Motacilla flava rayi* (Bp.).
H. Hamper Mill, at least three pairs nested (G.H.).
K. Elmers End sewage farm, nested (G.E.M., P.W.R.).
M. Ruislip Res., one pair probably nested. Passage migration in large numbers from 22nd July to 26th August, after which numbers decreased (G.H.).
S. Beddington sewage farm, several pairs nested (L.P.). Nested on Esher Common (J.E.R.).

GREY WAGTAIL. *Motacilla c. cinerea* Tunst.
K. Nested at Elmers End sewage farm (P.W.R.).

WHITE WAGTAIL. *Motacilla a. alba* L.
K. Elmers End sewage farm, one on 14th (G.E.M.) and 16th April (P.W.R.).
M. Staines Res., one on 14th April (G.C.L.) and on 2nd May (A.H.M.).
S. Beddington sewage farm, a male on 2nd May (L.P.).

BRITISH WILLOW TITMOUSE. *Parus atricapillus kleinschmidti* Hellm.
M. Denham, two on 23rd February (F.R.F., A.H.M.) and one on 30th (F.R.F.). Ruislip Common, seen regularly until 7th April (G.H.).

BRITISH LONG-TAILED TITMOUSE. *Aegithalos caudatus roseus* (Blyth).
M. Queen Victoria Street, E.C.4, four flying south in a strong west wind on 30th October (R.W.He.).

BRITISH GOLDEN-CRESTED WREN. *Regulus r.* (? subspecies).
M. Bushy Park, a large influx again noted in early November (J.E.R.).

RED-BACKED SHRIKE. *Lanius c. collurio* L.
K. Nested at Biggin Hill and Beckenham (P.W.R.).
M. Northwood and Ruislip, four pairs seen in this district (G.H.). Staines Res., an adult and two young on 7th July (A.H.M.).

S. Nested at Addlestone (P.A.D.H.), Ashtead (J.S.W.), Colley Hill and Epsom Downs (A.H.H.), Ham Common (G.C.L., A.H.M.), Limpsfield (K.R.C.), Walton Heath (A.H.H.) and Wimbledon Common (R.E.W.). Probably bred on Epsom Common (R.C.H., J.S.W.) and Mitcham Common (S.A.C.).

PIED FLYCATCHER. *Muscicapa h. hypoleuca* (Pall.).

M. St James's Park, one on 23rd September (E.M.Nn.).

GRASSHOPPER-WARBLER. *Locustella n. noevia* (Bodd.).

M. Northwood, one from 27th May until early June (G.H.). Staines Res., one heard on 28th April (G.C.L., A.H.M.).

S. Ashtead and Epsom Commons, ten to fifteen pairs (A.H.H., R.C.H., J.S.W.). Bookham Common, scarcer than 1934 (J.E.R.).

REED WARBLER. *Acrocephalus s. scirpaceus* (Herm.).

S. Beddington, at least two pairs nested (L.P.). Esher Common, one singing on 5th May (L.P.). Godstone, bred but scarcer than in 1934 (C.M.A., J.E.R.). Richmond Park, a pair from 2nd June to 8th July (C.L.C., R.W.Hn.). Wimbledon Common, one on 7th May (R.E.W.).

BLACKCAP. *Sylvia a. atricapilla* (L.).

M. Bushy Park, unusually abundant (J.E.R.).

S. Sutton, a nest with three eggs on 29th April (J.E.R. in *B.B.*, xxix, p. 58).

DARTFORD WARBLER. *Sylvia undata dartfordiensis* Lath.

S. Wimbledon Common, one on 26th October (R.E.W. in *B.B.*, xxix, p. 253).

ICELAND REDWING. *Turdus musicus coburni* Sharpe.

K. Darenth Valley, Shoreham, on 14th February 1934 (Dr J. M. Harrison in *Ibis*, 1934, pp. 395-6).

RING OUZEL. *Turdus t. torquatus* L.

S. Headley Down, two on 10th April (G.W.C.).

WHINCHAT. *Saxicola r. rubetra* (L.).

B. Thorney Ford, two to three pairs nesting (C.E.L.).

S. Nested on Epsom Common (A.H.H., R.C.H.) and Richmond Park (C.L.C.), and probably at Bookham Common (H.B.) and Walton-on-Thames (P.A.D.H.).

BLACK REDSTART. *Phoenicurus ochrurus gibraltariensis* (Gm.).

E. King George V Res., one on 26th January (K.R.A., see also *B.B.*, xxix, p. 28).

S. Brooklands sewage farm, a female on 22nd March 1931 (P.A.D.H. in *B.B.*, xxviii, p. 342). Barn Elms, an adult male on 30th November and 1st December (G.C.L. in *B.B.*, xxix, p. 253).

SAND MARTIN. *Riparia r. riparia* (L.).
M. Ruislip Res., seen on 24th March (G.H.).

SWIFT. *Apus a. apus* (L.).
M. Staines Res., two on 13th April (C.W.G.P.).
These appear to be the earliest arrival dates for both Sand Martin and Swift for the county (see *Birds of Middlesex*, W. E. Glegg, 1935).

NIGHTJAR. *Caprimulgus e. europaeus* L.
E. Epping Forest, at least two on 30th June (E.T.N.).
H. Batchworth Heath, bred (G.H.).
M. Ruislip, five to six pairs observed (G.H.).
S. Arbrook Common, one heard during June and July (K.P.K.). Epsom Common, at least two pairs during June and July (R.C.H., J.S.W.). Epsom Downs to Headley, several pairs (A.H.H.). Esher Common, a male on 5th May (L.P.). Limpsfield, a pair nested (K.R.C.). Richmond Park, one from 2nd to 28th June (C.L.C., E.G.P., R.E.W.). Walton Heath, two pairs on 14th July (A.H.H.).

WRYNECK. *Jynx t. torquilla* L.
M. Ruislip, one pair during the summer (G.H.).
S. Ashtead, seen on 29th April and 12th May (A.H.H.). Epsom Common, one on 27th April (J.S.W.). Limpsfield, a pair doubtless bred (K.R.C.). Tadworth, one on 13th April (H.B.). Walton Heath, a male on 28th June (A.H.H.).

WHITE-BREASTED BARN OWL. *Tyto a. alba* (Scop.).
E. Chigwell sewage farm, one on 17th March (R.McK.S., B.T.W.).
K. Elmers End sewage farm, seen from 1st January until 17th March. The remains of Water Rail and Snipe were found in its roosting place. Shooting takes place here so that the victims may have been winged (G.E.M., P.W.R.). (See also *L.N.*, 1934, p. 108).
M. Northwood, two heard on 3rd January (G.H.).
S. Ashtead Common, one seen on 4th May. A clutch of six eggs reported to have been taken from here (R.C.H.). Occasionally seen and a roost found (J.S.W.). Chelsham, one seen on 10th November (K.R.C.). Claygate, one on 10th June (K.P.K.), at Ewell in August and November (R.S.R.F.), at Malden on 26th February and 13th March (L.M.E.), in Richmond Park on 22nd May (C.L.C.), at Surbiton on 10th October (J.E.R.), and at Tadworth on 24th January (H.B.).

HOBBY. *Falco s. subbuteo* L.
M. Staines Res., two on 15th September (W.E.G. in *B.B.*, xxxix, pp. 179-180).

BUZZARD. *Buteo* ? species.
E. Epping Forest, one on 28th and 31st March and on 14th April (several observers). The evidence is conflicting and insufficient to determine the species (Eds.).

SPARROW HAWK. *Accipiter n. nisus* (L.).

H. Chorley Wood, one on 17th February (G.H.).

M. Bushy Park, bird flushed from a nest on 11th May (J.E.R.). Regents Park, one on 16th March (M.R.). Ruislip, one on 28th May and 27th September (G.H.). Staines Res., one on 25th October (A.H.M.). White Webbs Woods, a pair nested in 1933 (E.M.Ns.).

S. Ashtead, seen on various occasions and doubtless bred but nest not found (R.S.R.F., R.C.H., J.S.W.). Beddington, one on 10th September (P.W.R.). Cheam, a female on 2nd June (P.H.T.H.). Chelsham, a female on 10th November (K.R.C.). Epsom Common, one on 6th July (L.M.E.). Epsom sewage farm, one on 28th September (R.S.R.F.). Limpsfield, fairly common, nests probably in all large woods (K.R.C.). Oxshott, nested (L.P.). Richmond Park, reported on many occasions but probably did not nest (C.L.C.). Titsey, a male on 22nd December (K.R.C.).

BEWICK'S SWAN. *Cygnus b. bewickii* Yarr.

M. Staines Res., a young bird on 27th October (F.R.F., A.H.M.; see also *B.B.*, xxix, p. 216).

[BRENT GOOSE. *Branta b. bernicla* (L.).

S. Barn Elms Res., " one on 11th April cannot have been a wild bird " (F.R.F.).]

SHELD-DUCK. *Tadorna tadorna* (L.).

E. Walthamstow Res., one on 20th January (E.T.N.).

M. Littleton Res., four on 26th December 1934, and two on 13th April (P.A.D.H.). Staines Res., one again remained throughout the year but others are occasionally seen. 3 on 19th and 26th January, 4-5 in March, 3 on 5th and 8th May, and 3 on 6th December, seen by various observers.

S. Barn Elms Res., 4 on 6th December (E.G.P.).

MALLARD. *Anas p. platyrhyncha* L.

Several counts have been reported, the most outstanding being:—

M. Littleton Res., about 600 on 26th December 1934, and from 400 to 500 on 29th July (P.A.D.H.).

GADWELL. *Anas strepera* L.

S. Godstone, seen on 12th April (C.M.A., J.E.R.). (See also *L.N.*, 1932, 1933, and 1934). Birds seen at Barn Elms Res. and Richmond Park appear to be " escapes."

TEAL. *Anas c. crecca* L.

M. Ruislip, one pair nested but the nest was robbed (G.H.).

WIGEON. *Anas penelope* L.

E. Walthamstow Res., a male on 25th May (R.W.P.). A late date, but may possibly be attributed to an escape from the parks.

PINTAIL. *Anas a. acuta* L.

M. Hampstead Heath Pond, a drake first seen on 16th December 1934 was last seen on 23rd April (W.B.W., see also *L.N.*, 1934, p. 110).

SHOVELER. *Spatula clypeata* (L.).

M. Littleton Res., about 20 on 21st March (P.A.D.H.). On 24th May a female and one young, about three weeks old, were seen (J.P.H.) and a male on 31st May (P.A.D.H.). Staines Res., maxima, about 12 on 7th March and 16 on 26th October (A.H.M.). Present up to 10th May and from 14th September onwards.

S. Beddington, a pair on 10th April (P.W.R.). Brooklands sewage farm, two pairs on 14th April and 2nd May, two males on 29th May, and two males and one female on 9th June (P.A.D.H.). Weybridge, a pair on 27th March (L.P.).

TUFTED DUCK. *Nyroca fuligula* (L.).

M. Staines Res., a brood of 7 ducklings on 23rd July (A.H.M.). First bred here in 1934.

S. 730 were counted at Barn Elms and Lonsdale Road Reservoirs on 30th January (A.H.M.).

SCAUP DUCK. *Nyroca m. marila* (L.).

M. Ruislip Res., a male on 14th December (G.H.). Staines Res., a female on 16th November (F.R.F.).

GOLDENEYE. *Bucephala c. clangula* (L.).

E. King George V Res., three on 5th January, seven on 2nd, one on 9th February, one on 6th April (W.A.W.), one on 10th (E.T.N.), and five on 30th November (W.A.W.). Walthamstow Res., two on 6th and 20th January (E.T.N.).

M. Brent Res., one on 17th and 24th March (J.D.D.). Kensington Gardens, one reported originally as a female on 19th October (*L.N.*, 1934, p. 112) proved to be a male and stayed until 18th May when it was killed by Mallard drakes (G.C.L., A.H.M., E.G.P., see also *B.B.*, xxix, p. 60). Littleton Res., two on 12th January, one on 7th February (P.A.D.H.) and two on 24th May (J.P.H.). Ruislip Res., two from 18th January to 16th February (G.H.). Staines Res., maximum winter 1934-5 was about 20 (A.H.M.).

S. Barn Elms Res., one on 27th January (G.C.L., E.G.P.), and 9th February (C.W.G.P.). Molesey, 6 on 12th January, 11 on 19th March, about 10 on 5th April and 11 on 30th November (P.A.D.H.).

LONG-TAILED DUCK. *Clangula hyemalis* (L.).

M. Staines Res., one from 23rd October 1934 to 24th March and from 29th September to the end of the year (F.R.F., A.H.M., and other observers).

COMMON SCOTER. *Oidemia n. nigra* (L.).

M. Staines Res., four on 7th April (F.R.F., G.C.L., A.H.M.), six on 2nd June (F.R.F., G.C.L.), and four on 19th November (A.H.M.).

S. Barn Elms Res., a male on 29th April (G.C.L., A.H.M., E.G.P.) and 22nd October (A.H.M.).

GOOSANDER. *Mergus m. merganser* L.

E. King George V Res., 4 on 19th January, 6 on 2nd and 11 on 9th February, two on 30th March and one on 6th April (W.A.W.). Walthamstow Res., one to three seen in February and March (R.W.P., W.A.W.), 21 on 22nd and 44 on 28th and 29th December (E.M., E.T.N., W.A.W.).

M. Littleton Res., maximum winter 1934-5 was about 14 on 12th January. Staines Res., during January numbers fluctuated between 40 and 90, rising to 125 on 24th February and 152 on 3rd March. After falling to 83 on the 7th there was little change until the end of the month, numbers then fell to 40 by the 7th April when they were last seen. One was seen on 26th October, then none until November, four being seen on 30th, rising to 30 on 10th December with little change for the rest of the month (G.C.L., A.H.M., and other observers).

S. Maximum numbers seen:—Barn Elms Res., seven on 3rd March (G.C.L.) and 17th December (E.G.P.). Molesey Res., 31 on 19th March (P.A.D.H.). Richmond Park, 37 on 10th February (C.L.C.). There were 143 at Molesey Res. on 10th October 1934 (P.A.D.H.).

RED-BREASTED MERGANSER. *Mergus Senator* L.

M. Staines Res., a male from the 2nd to 13th January (F.R.F., A.H.M.), a female on 2nd January (F.R.F., L.M.E., G.C.L., A.H.M.), 24th February (G.C.L., A.H.M.), 2nd (F.R.F.) and 3rd March (F.R.F., G.C.L., A.H.M.). See also *B.B.*, xxxviii, p. 350.

SMEW. *Mergus albellus* L.

E. King George V Res., one on 6th April (W.A.W.). Walthamstow Res., maximum number winter 1934-5 was 25 (E.M.). Two on 22nd and 16 on 28th and 29th December (E.M., E.T.N., W.A.W.).

M. Brent Res., a pair on 17th March (J.D.D.). Hampton Res., two on 26th February (J.E.R.), Ruislip Res., one from 27th January to 9th February (G.H.). Staines Res., one from 2nd to 20th January (F.R.F.), and one to three from 24th February to 17th March (F.R.F., G.C.L., A.H.M., and other observers).

S. Maximum numbers seen:—Barn Elms Res., 5 on 27th January (G.C.L., E.G.P.). Lonsdale Road Res., 6 on 16th February (G.C.L.). Molesey Res., 36 on 22nd December (G.C.L.).

CORMORANT. *Phalacrocorax carbo* (L.).

Several records have been received but have not been included here on account of the wandering of full-winged birds from St James Park.

SHAG. *Phalacrocorax a. aristotelis* (L.).

E. Walthamstow Res., one in first winter plumage found shot on 3rd February (H.A.P., E.T.N., see also *B.B.*, xxviii, p. 313). The skin is now in the Society's collection.

H. Hoddesdon, three were found in a nursery garden on 7th February and sent to the Zoo alive. There was a strong north-east wind during the nights of the 4th and 5th, but weather conditions were fairly quiet on 6th and 7th (D.S.-S., see also *B.B.*, xxviii, p. 313).

M. Hornsey, N.8, one was found in a garden on 6th February and sent to the Zoo (D.S.-S., see also *B.B.*, xxviii, p. 313). Hyde Park, one on the Serpentine from 14th to 18th October (D.G., E.G.P., see also *B.B.*, xxix, p. 293). Osterley Park, nine on the lake on 9th February (E.C.R., see also *B.B.*, xxviii, p. 313).

S. Childown, near Chertsey, one in first winter plumage found in a garden on 9th February by Mr Sympson and released on the Thames next day (H. F. Witherby in *B.B.*, vol. xxviii, p. 313).

GREAT CRESTED GREBE. *Podiceps c. cristatus* (L.).

An account of the breeding population of this species in the area is given separately by Mr P. A. D. Hollom. Owing to lack of space other counts are omitted, but it is hoped that later a summary may be prepared for the years 1931-5.

SLAVONIAN GREBE. *Podiceps auritus* (L.).

E. Walthamstow Res., one on 10th August (E.M., W.A.W.) and on 21st September (E.M.).

RED-NECKED GREBE. *Podiceps g. griseigena* (Bodd.).

E. King George V Res., one on 30th March and 6th April (W.A.W.).

BLACK-NECKED GREBE. *Podiceps n. nigricollis* Brehm.

E. King George V Res., one on 9th February, 30th March, and 6th April (W.A.W.). Walthamstow Res., two on 20th (E.T.N.) and one on 28th January (W.A.W.).

M. Ruislip Res., one on 5th and 6th October (G.H.). Staines Res., two on 17th July (A.H.M.), one from 24th September to 3rd October (F.R.F., A.H.M.), six on 5th October (F.R.F., A.H.M., see also *B.B.*, xxix, 181), one on 13th (L.M.E., F.R.F., P.A.D.H.), two from 19th October to 9th November (F.R.F., A.H.M.) and on 11th November (A.H.M.).

S. Barn Elms Res., one adult in summer dress and one young from 4th to 15th July (F.R.F., A.H.M.).

GREAT NORTHERN DIVER. *Colymbus immer* Brünn.

S. Molesey Res., one on 30th November (P.A.D.H.), 22nd December (G.C.L., A.H.M.), and 28th December (F.R.F.).

RED-THROATED DIVER. *Colymbus stellatus* Pontopp.

M. Staines Res., one seen on 2nd, 3rd, 19th, and 20th January (F.R.F., G.C.L., A.H.M., see also *B.B.*, xxix, p. 29).

TURTLE-DOVE. *Streptopelia t. turtur* (L.).

S. Limpsfield, over 50 on 1st September (K.R.C.).

STONE-CURLEW. *Burhinus oe. oedicnemus* (L.).

S. Richmond Park, one, which finally flew westwards on 14th April (F.R.M.).

BRITISH OYSTER-CATCHER. *Hoematopus ostralegus occidentalis* Neumann.

M. Hyde Park, one flying over on 9th September 1934 (E.M.Nn.).

RINGED PLOVER. *Charadrius h. hiaticula* L.

E. King George V Res., four on 28th September (E.M.) and one on 12th October (W.A.W.).

H. Hamper Mill, one on 26th May and 1st September, and two on 22nd September (G.H.). Watford sewage farm, 12 on 22nd September (G.H.).

M. Ruislip Res., two on 18th, nine on 25th, five on 26th, and two on 28th May (G.H.). Staines Res., one on 29th May and on 22nd (A.H.M.) and 29th September (L.M.E.).

S. Barn Elms Res., one on 1st June (E.G.P.). Brooklands sewage farm, one on 14th April, six on 29th May, and two on 25th July (P.A.D.H.). Epsom sewage farm, one on 4th May (R.S.R.F., R.C.H., J.S.W.).

GOLDEN PLOVER. *Charadrius apricarius* L. ? sub-species.

E. Navestock, one on 17th March (R.McK.S., B.T.W.), Nazeing Common, 43 on 19th January. Thornwood, near Epping, 40 on 19th January (R.McK.S.),

K. Elmers End sewage farm, one on 29th December (G.E.M.).

M. Ruislip, 60 on 7th and 10 on 14th January (R.McK.S.).

S. Beddington sewage farm, 25 on 21st (S.A.C.), and 17 on 22nd December (L.P.). Ewell, one on 27th December (A.H.H.).

TURNSTONE. *Arenaria i. interpres* (L.).

S. Brooklands sewage farm, one on 30th May 1934 (P.A.D.H. in *B.B.*, xxviii, p. 342).

RUFF. *Philomachus pugnax* (L.).

M. Ruislip Res., a male on 18th May (G.H.).

S. Brooklands sewage farm, one on 30th July 1934 (P.A.D.H. in *B.B.*, xxviii, p. 342).

KNOT. *Calidris c. canutus* (L.).

M. Staines Res., a flock of 10 flew over on 16th November (G.C.L.).

DUNLIN. *Calidris alpina* (L.) ? sub-species.

H. Hamper Mill, one on 31st March and 22nd September (G.H.). Watford sewage farm, five on 1st and two on 15th September (G.H.).

M. Kensington Gardens, one on 30th April (G.C.L., A.H.M., E.G.P.). Littleton Res., one on 7th August (P.A.D.H.). Ruislip Res, one to four on various dates from 21st August to 24th September (G.H.). Staines Res., one on 11th August (R.C.H.).

S. Barn Elms Res., one to four seen in June, July, August, September and November (A.H.M., E.G.P.). Brooklands sewage farm, five on 14th April, two on 25th July (P.A.D.H.).

CURLEW-SANDPIPER. *Calidris testacea* (Pall.).

S. Brooklands sewage farm, one on 20th and two on 22nd September 1931 (P.A.D.H. in *B.B.*, xxviii, p. 342).

LITTLE STINT. *Calidris minuta* (Leisl.).

M. Ruislip Res., one on 14th (G.H.) and on 15th September (G.H., C.A.N.).

WOOD-SANDPIPER. *Tringa glareola* L.

S. Brooklands sewage farm, one on 15th and 16th August 1934 (P.A.D.H. and J. B. Watson in *B.B.*, xxviii, p. 342).

GREEN SANDPIPER. *Tringa ochropus* L.

E. Abridge, one on 10th March (R.McK.S.). Chigwell sewage farm, one from the beginning of the year to 14th April, one on 1st September, and one to two from 12th October to 1st December (E.T.N., R.McK.S., W.A.W.). Navestock, one on 28th July (R.McK.S.).

H. Hamper Mill, one on 7th, seven on 21st, and three on 27th July, five or six on 1st and three on 15th September, three on 6th October, and one on 3rd November. Watford sewage farm, several on 1st September, possibly those seen at Hamper Mill an hour earlier, and one on 6th October. West Hyde, three on 13th January (G.H.).

M. Edmonton sewage farm, one to two on various dates from 4th August to 14th September (E.M.). River Colne, near Denham, one on 30th November (F.R.F., A.H.M.). Staines Moor, one on 28th July (F.R.F., A.H.M.). Staines Res., four on 12th September (J.E.R.).

S. Barn Elms Res., one on 5th, 7th and 9th August, 13th and 21st (E.G.P.), and on 28th September (A.C.N., E.G.P.), and one on 5th October (A.C.N.). Brooklands sewage farm, six on 17th and 18th August 1932, and one on 16th August 1934 (P.A.D.H. in *B.B.*, xxviii, p. 342). Epsom sewage farm, one on 18th August (R.S.R.F.).

BRITISH REDSHANK. *Tringa totanus britannica* Matth.

H. Hamper Mill, two pairs bred (G.H.).

K. Westerham, nested (L.P.).

M. Edmonton sewage farm, one pair bred (E.M.). Between Northwood and Harefield, two pairs bred; Ruislip, believed to have bred (G.H.).

S. Nested at Beddington sewage farm (S.A.C.) and probably at Epsom sewage farm (R.C.H.) and at Limpsfield (K.R.C.).

GREENSHANK. *Tringa nebularia* (Gunn.).

S. Brooklands sewage farm, two on 30th May 1931, and one on 11th August 1932 (P.A.D.H. in *B.B.*, xxviii, p. 342).

GREY PHALAROPE. *Phalaropus fulicarius* (L.).

M. Staines Res., one on 21st September (A.H.M.).

S. Barn Elms Res., one from 8th to 16th November (A.H.M., and other observers).

BLACK-TAILED GODWIT. *Limosa l. limosa* (L.).

S. Brooklands sewage farm, one on 17th, 18th and 20th August 1932 (P.A.D.H. in *B.B.*, xxviii, p. 342).

COMMON CURLEW. *Numenius a. arquata* (L.).

K. Keston, one flew over going northwards on 29th September (G.E.M.).

M. Staines Res., three on 22nd August (D.G., A.H.M.). Westminster, several heard flying over on 21st August (E.M.Nn.).

S. Barn Elms Res., one on 10th and 11th April (E.G.P.), and one on 29th December (G.C.L.).

COMMON SNIPE. *Capella g. gallinago* (L.).

M. Nested between Northwood and Harefield (G.H.)

S. Nested at Beddington sewage farm (L.P.) and Limpsfield (K.R.C.).

FAEROE SNIPE. *Capella gallinago faeroeensis* (Brehm).

K. Near Shoreham, December 1925 (Dr J. M. Harrison in *Ibis*, 1934, pp. 395-6).

JACK SNIPE. *Lymnocryptes minimus* (Brünn.).

E. Chigwell sewage farm, one on 17th and 24th March (R.McK.S., B.T.W., W.A.W.).

H. Watford sewage farm, several on 30th January, and 10th March (G.H.).

K. Elmers End sewage farm, four on 10th March, three on 17th March, and one on 22nd December (G.E.M.).

M. Highgate Ponds, one on 9th January (J.S.C.). Ruislip Res., one seen frequently during the winter stayed until 27th April; one on 21st December (G.H.).

S. Beddington sewage farm, one on 22nd December (L.P.). Epsom sewage farm, six on 16th March (R.C.H.), one on 24th March (R.S.R.F.), one on 6th and two on 13th April (J.S.W.).

BLACK TERN. *Chlidonias n. niger* (L.).

E. Navestock lake, one on 20th April (R.McK.S.).

M. Hyde Park, one at the Serpentine on 27th May (G.C.L.). Littleton Res., one on 31st May (P.A.D.H.) and on 2nd October (J.P.H., A.H.M.). Staines Res., five or six on 26th May (F.R.F., G.C.L., A.H.M.), four on 1st June (A.H.M.), and 10 on 22nd September (A.H.M., see also *B.B.*, xxix, p. 186).

S. Barn Elms Res., one on 27th May (A.H.M., E.G.P.). Molesey, two on 23rd September (P.A.D.H.).

COMMON TERN. *Sterna h. hirundo* L.

E. King George V Res., one on 21st September (W.A.W.).

M. Hyde Park, one over the Serpentine on 28th May (F.R.F., E.G.P.). Kensington Gardens one over the Long Water on 21st September (E.G.P.). Littleton Res., in a party of 17 terns on 31st May, the only one that called was of this species (P.A.D.H.), one on 2nd October (J.P.H.). Staines Res., two on 28th April (G.C.L.), three on 1st (A.H.M.), one on 2nd June (G.C.L.), about 50 on 22nd August (A.H.M., see also *B.B.*, xxix, p. 186), two on 21st, 11 on 22nd (A.H.M.), and one on 28th September (F.R.F., A.H.M.).

S. Barn Elms Res., 25 on 23rd August (A.H.M.), one on 18th and 23rd September, 15 on 28th September, one on 4th (E.G.P.) and 5th October (A.C.N.). Molesey, one on 23rd September (P.A.D.H.).

ARCTIC TERN. *Sterna macrura* Naumann.

E. Walthamstow Res., remains of one found on 25th May by E.T.N., were identified by W.E.G.

M. Ruislip Res., one on 22nd September (G.H.). Staines Res., remains of one were found on 1st, one seen on 26th, two on 28th, two on 29th September, and two on 1st October (A.H.M., F.R.F., see also *B.B.*, xxix, p. 186).

LITTLE TERN. *Sterna a. albifrons* Pall.

H. Hamper Mill, six on 22nd September (G.H.).

M. Ruislip Res., one on 22nd September, seen an hour after those at Hamper Mill (G.H.).

SCANDINAVIAN LESSER BLACK-BACKED GULL. *Larus f. fuscus* L.

M. River Thames, at Chiswick, one on 8th and 18th February, Hammersmith, one on 24th March, three on 20th July, twelve on 20th August, and two or three on 3rd October (A.H.M.), King's Reach, one on 30th October (R.S.R.F.).

S. Barn Elms Res., two adults on 5th January (G.C.L. in *B.B.*, xxvii, p. 305), Lonsdale Road Res., six on 11th July (A.H.M.).

GREAT BLACK-BACKED GULL. *Larus marinus* L.

E. Walthamstow Res., one on 21st September (E.T.N., H.A.P.).

M. Littleton Res., one on 4th February (P.A.D.H.) and five on 6th August (J.P.H.). River Thames, Chiswick, three on 11th March and two on 28th December, Hammersmith, one on 20th January and on 18th December (A.H.M.), King's Reach, eight on 22nd February (R.S.R.F.).

S. Barn Elms Res., one on 5th and 15th January, 8th and 24th February, and two on 18th February (G.C.L., A.H.M.). River Thames, London Bridge, a pair on 3rd September, and one on 9th September (H.J.B.), Waterloo Bridge, two seen from 20th January to 25th March (J.S.W.).

KITTIWAKE GULL. *Rissa t. tridactyla* (L.).

E. Walthamstow Res., a dead bird found on 14th May (E.T.N.).

ARCTIC SKUA. *Stercorarius parasiticus* (L.).
M. St James Park, one on 18th September (G.H.).

RAZORBILL. *Alca torda* L.
E. Walthamstow Res., the bird which was first seen on 11th November 1934 was last seen alive on 25th April, and was found dead on 4th May (E.T.N., H.A.P., R.W.P., W.A.W., see also *L.N.*, 1934, p. 118 and *B.B.*, xxviii, pp. 313-4, and xxix, p. 63). We understand that the bird was examined by G.C.L., but no cause of death could be ascertained.

SOUTHERN PUFFIN. *Fratercula arctica grabae* (Brehm).
M. Harrow, one found on 12th and another on 24th October were sent to the Zoo. Strand, W.C.1, one was found outside the Shell Mex House on 14th October and taken to the Zoo (D.S.-S.).
S. Banstead, one picked up alive on 20th October 1934 (C.M.A. in *B.B.*, xxviii, p. 213).

LAND-RAIL. *Crex crex* (L.).
E. Chigwell sewage farm, one from 19th April to 16th June (R.McK.S., B.T.W., W.A.W.).
K. Elmers End sewage farm, one seen on 8th and 9th September (G.E.M., P.W.R.).

WATER-RAIL. *Rallus a. aquaticus* L.
K. Elmers End sewage farm, one seen on 13th and 20th January and 17th February (G.W.C., G.E.M., P.W.R.).
M. Ruislip Res., one on 10th February (G.H.).
S. Beddington, two on 20th January (L.P.).

RED-LEGGED PARTRIDGE. *Alectoris r. rufa* (L.).
E. Near Abridge, two on 22nd April (B.T.W., W.A.W.). Ongar, two families on 6th August (W.A.W.).
H. Watford sewage farm, two on 8th December (G.H.).
M. Staines Res., five on 24th March (F.R.F.).
S. Nested Limpsfield (K.R.C.). Petersham Park, two seen on 26th May (C.L.C.).

ERRATUM.

TEAL. H. Record for Hamper Mill (*L.N.*, 1934, p. 109, lines 46-47). This record should be under WIGEON.

SPECIAL RECORDING.

In Co-operation with the British Trust for Ornithology.

During 1935 the Ornithological Section continued to support the British Trust by taking part in the Great Crested Grebe (*Podiceps c. cristatus* L.) sample census and other suitable enquiries. Several members made full reports on the breeding of the Great Crested Grebe, and a summary for 1931-5 was handed to Mr P. A. D. Hollom, whose report is published separately in this volume.

Some further information has been received concerning the breeding of the WOODCOCK (*Scolopax r. rusticola* L.). A pair nested at Thornton Hall, Brentwood, about 1913, at which time Woodcock were especially plentiful in winter, 30-40 being shot in one season. In 1935 a nest was found in the Limpsfield district and young were seen in April. Woodcock are reported to have bred here previously and have also been seen at Oxted in circumstances which suggest breeding. Four birds wintered in Richmond Park, 1934-5, and one or more in Bushy Park. Twelve were seen by a keeper at Batchworth Heath on 14th December 1935, and odd birds were recorded at Beulah Hill, Dulwich Woods, and in Epping Forest.

With regard to the HERON (*Ardea c. cinerea* L.) there is a welcome increase in the number of occupied nests in the Lea Valley. At the Walthamstow Reservoir 58 nests were occupied and 19 at Wanstead Park, a total of 77 compared with 67 last year (*L.N.*, 1934, p. 47). At Hersham 16 nests were occupied, and at Gatton Park seven birds were seen on 31st March, although only one pair nested. In Richmond Park there were on 14th April 65 nests, of which 48 were occupied, the same as in 1934.

Several enquiries are being conducted by the British Trust this year in addition to those mentioned in the Section's annual recording circular, and any member who is interested or who would like a copy of the circular should apply to the Secretary of the Recording Committee.

The report on the special species is based on the Society's records and the publications listed in the *London Naturalist*, 1934, p. 119, with the following additions:—

(17) 1935—*History of the Birds of Middlesex*, W. E. Glegg.
(18) 1935—South-Eastern Bird Report for 1934, edited by R. Whitlock.
(19) 1935—Notes on the Birds of Edmonton Sewage Farm, 1933-4 (*L.N.*, 1935).

REDSTART. *Phoenicurus p. phoenicurus* (L.).

The Redstart is very unevenly distributed in the area, being in most parts a passage migrant in small numbers. Breeding occurs chiefly in old parks, orchards, and hornbeam woods.

North of the Thames the chief stronghold is Epping Forest, especially in the Chingford, High Beach, and Loughton areas, preference being shown in nesting for pollarded hornbeams. Outside the forest it is confined in the North-east of the area to Hainault Forest and the vicinity of Brentwood and Weald Park, where in 1929 it was considered to be well-established. Distribution may once have been wider, as in 1900 it was breeding commonly around Winchmore Hill and probably did so in 1924-5, while in 1908 a pair bred on Woodford golf links.

In the Hertfordshire section there are migration records for Moor Park, Haileybury, Watford, Elstree, Radlett, Rickmansworth, and Chorley Wood, but breeding appears to be spasmodic—Cassiobury Park, two nests in 1904, and Moor Park, one in 1929. It has only been noted in the Buckinghamshire part of our area in April 1931 at Iver Heath, and in Black Park.

In Middlesex, Harrisson considered it in the Harrow district to be a scarce and scattered nesting species, with little passage, and, though evidence is rather scanty, it appears to be scarcer than it was some years ago. It probably breeds annually in Bushy Park (4-5 pairs in 1935), at Stanmore Common, Trent Park, and in the vinicity of White Webbs Wood (3 pairs 1934, one pair 1935), but in very small numbers. Nesting has also taken place at Uxendon Farm 1928, Dugdale Hill 1931, and in Osterley Park up to 1927. On spring passage it is noted with some regularity on Hampstead Heath and in Regents Park, though in autumn it is more often seen further west around Ruislip—one was seen at Sandy Lodge on 1st September 1935. It was once a regular visitor on migration to Kensington Gardens, where two pairs bred in 1876, but although still seen—25/9/35—is now infrequent.

South of the Thames the Redstart is common in Richmond Park, where it was estimated that 20 pairs were breeding in 1935. As in the North, the partiality of Redstarts for parkland is particularly noticed, nearly all the nests being found in scattered trees among which oak was predominant. The species is comparatively scarce in the denser plantations, and apparently prefers little or no undergrowth. On Wimbledon Common it is seen only on migration, the woods lacking the old timber found in Richmond Park. In Kent, Ticehurst stated in 1909 that it was increasing in the Orpington and St Mary Cray districts and was generally distributed in the Valley of the Darenth, where orchards are plentiful, and around Blackheath and Bromley. There are few recent records, however, and its range is now probably more restricted, though it was still fairly common at Chislehurst in 1934. Other breeding records are for Wisley in 1930 and around Sevenoaks, where it was nesting in small numbers in 1934. Apart from these localities odd birds are seen on migration with some regularity on the North Downs, and in the country between Ashtead and Westerham. Although most of these records relate to single birds, five or six were seen at Ashtead on 1st September 1935.

In general, the range of the Redstart in the area seems to have become restricted of recent years, although in Richmond Park reference to past publications seems to indicate an increase since the early years of this century. While oak and hornbeam are the favourite trees in Richmond Park and Epping Forest respectively, this is probably because they are the commonest old timber available, and other records mention nesting in crab-apple and hawthorn trees. Open woods or scattered trees with little undergrowth, also orchards, are the typical habitats within the area, though even in these the species is only locally common.

British Great Spotted Woodpecker. *Dryobates major anglicus* (Hart).

This species is common in all wooded districts around London, being distributed sparsely in more open country. In Epping Forest it is very well established, and, though it was little known during the last century, there appears to have been no great change in numbers of recent years. For nesting old woodland is preferred, crab-apple and hornbeam being the favourite trees, though beech, birch, ash, and oak are all used, and there is one record of a nest in holly. East of the Forest it is found in Hainault Forest and in parkland, while it has been noted as breeding regularly around Brentwood. There is an interesting record of several at Dagenham Breach on 22nd February 1930.

In the Enfield and Winchmore Hill district it is generally distributed, showing a preference for swampy situations with rotten timber. Birch woods, usually on damp soil, are the chief haunts around Harrow, where the species is abundant. At Hanwell, Horsendon Hill, and Perivale Wood it was considered (1925-30) to be the commonest woodpecker. Around Northwood it is generally distributed, and is found along the River Colne frequenting old willow trees. Parkland is also favoured, breeding occurring in Osterley and Langley Parks, but in Bushy Park, where several pairs breed, it is inclined to keep to the woods rather than the scattered trees. Nearer London it is well established in Ken Wood, and is now frequently seen in Regent's Park and Kensington Gardens, near which it has bred on several occasions and may breed annually.

In Surrey and Kent it has a widespread range, being least common in very thick woods and in fairly open country. The birch wood again seems to be the favourite habitat, though other types of wood are regularly used. On the North Downs, for example, beech woods are frequented, while in a park near Beckenham one or two pairs breed regularly in Scots pines. Though it is fairly common in coniferous woods, there is little doubt that it prefers a more open situation, especially those in a damp locality where rotten wood provides an easy food supply and suitable nesting sites. Where distribution is so wide localities need hardly be mentioned, but it is of interest to record that 6 or 7 pairs bred in Richmond Park in 1935. From the flat regions along the Thames records are confined to occasional wanderers.

In the area as a whole there are few types of wood in which it is not found at one time or another, and it has been recorded as breeding in at least nine different species of trees. That the birch is the most usual is probably because there are more rotten trees of this species than of most others, but in any case it is usually chosen if available. The necessity for rotten wood is almost certainly the dominant factor in governing a choice of habitat.

There is some evidence to show that the species wanders in winter. Birds are frequently observed feeding in gardens in the Hampstead and Epping Forest districts, while it is also seen outside the breeding season at Beddington and Edmonton Sewage Farms; around Limpsfield it is noticed to wander away from the woods in winter. While many remain in the woods, *local* distribution would thus appear to be wider outside the breeding season.

Although in the case of a woodland species fluctuations in numbers are difficult to estimate, there is no doubt that the abundance of this species is of comparatively recent date. Harting (1866) said that it had decreased in Middlesex and was one of the rarest birds, while even in 1909 Dixon reported observers as remarking on its rarity in Richmond Park. In Epping Forest the first nest was recorded in 1832, and there seems to have been little increase before the present century. Within the last few years there is no evidence of any change.

COMMON POCHARD. *Nyroca f. ferina* (L.).

This species, once a purely winter visitor in small numbers to the London area, has increased greatly in recent years and odd birds are now frequently seen throughout the year. Breeding has taken place at Barn Elms Reservoir in 1927 and 1929, Beddington 1931 and 1933, Gunnersbury Park 1931, Osterley Park 1932, and Richmond Park 1930-2. There was an isolated record of breeding in Regent's Park in 1877. In addition to definite nesting records, there are many reports of Pochard in June in circumstances which suggest breeding. The nest is usually situated on floating vegetation and it may be the absence of any cover on the large reservoirs that prevents more frequent breeding, though at Barn Elms the species has bred on dry ground. At the remaining localities where breeding has taken place and on some other waters, conditions are quite suitable but search for the nest is difficult.

It is impossible to give an accurate account of the Pochard's movements in the area, as in this species more than in most ducks there is a great tendency to sudden influxes. Normally birds first appear in July or August, after which there is usually a falling-off in numbers until November or December. Large numbers are frequent in these months, decreasing again in the early part of the year. Passage is prominent in March, some birds staying into April, while a few may remain during the summer. These numbers, however, are very variable, as, for example, in 1934, when there were several marked fluctuations on the Round Pond in January, 82 being present on the 11th, the largest number yet recorded there.

Early in the year the species is normally commoner at the Barn Elms, Brent, and Walthamstow Reservoirs than at Staines, and would appear to prefer the smaller reservoirs to the large waters at Littleton or Staines. There is insufficient evidence to determine what part food-supply plays in such distribution, though it is interesting to note that large numbers are seldom long maintained at Staines, whereas elsewhere they may stay for several months.

Many observers have made repeated counts showing the sex ratio in parties of Pochard. There is an overwhelming majority of cases in which males exceed the female or immature birds, the disproportion being least noticeable in small parties. On a long series of counts on the Round Pond the ratio for parties of over 20 birds averages between three and four to one. This ratio, though naturally liable to variation, was also noted at Ruislip, where in a party of about 400 an actual count of over 300 birds gave a proportion of about four to one. Females have only been recorded as outnumbering males in comparatively small parties, one of the largest being of 33 females and 32 males at Barn Elms, 8/11/30.

With regard to actual numbers, the largest party recorded in the area was at Barn Elms on 3rd December 1925, and contained over 500 birds. In 1935 the species was only in small numbers at Ruislip and Staines Reservoirs in the early part of the year, but was abundant at Barn Elms in January, 246 on the 7th, and at Walthamstow, 157 on 27th, while about 50 were at the Brent Reservoir on the 17th February. Breeding was not proved, but there were June records for Beddington and Richmond. Immigration was first noted in this month at Hamper Mill and at Staines. There was an increase during July at Staines, while at Walthamstow the numbers were over 220 on the 22nd, but the most striking movement began in late October. Numbers increased steadily until an exceptional total must have been reached for the area. Maxima for some of the reservoirs were as follows:—Barn Elms, 233+ on 22nd December; Brent Reservoir, 150+ on 15th and 26th December; Ruislip, about 400 on 28th December; Staines, 250-300 on 15th December. Although movement between the reservoirs is possible, several waters are not included, and, since numbers were very high throughout the month at the above localities, it is probable that there were considerably over a thousand birds in the area.

ARRIVAL AND DEPARTURE OF MIGRANTS, 1935.

In order to economise space the arrival and departure dates have been amalgamated in chronological order. Only the earliest and latest dates for each county are given. Recorders have made a good response to the appeal for more late dates, but many more are needed before they become really representative.

HOODED CROW.

Mar. 5—M. Staines Res. .... A.H.M.
„ 31—K. Elmers End G.E.M., P.W.R.
May 2—S. Beddington .... L.P.
Nov. 9—E. King George V Res. E.M.
Dec. 8—K. Elmers End ...... G.E.M.

SISKIN.

Mar. 15—K. Beckenham ...... P.W.R.
April 15—M. Highgate .... J.D.D.
May 1—S. Wimbledon ...... R.E.W.
Oct. 6—S. Epsom .... M.D.L.
„ 30—M. Bushy Park ...... J.E.R.
Dec. 1—K. Beckenham ...... P.W.R.

BRAMBLING.

April 7—H. Watford .... G.H.
„ 13—S. Richmond Park G.C.L.
S. Epsom Downs ... J.S.W.
„ 17—E. Epping Forest ...... J.R.
„ 21—K. Westerham ...... M.M.H.
Oct. 22—S. Richmond Park W.E.G.
„ 24—E. Epping Forest ...... J.R.
Nov. 6—K. Keston .... M.M.H.
„ 12—M. Bushy Park ...... J.E.R.

TREE PIPIT.

April 6—S. Epsom .... R.S.R.F.
„ 12—E. Epping Forest ... P.D.H.
„ 14—M. Staines Res. ...... G.C.L.
„ 20—K. Farnborough ... M.M.H.
„ 28—H. Rickmansworth ... G.H.
Aug. 17—M. Ruislip .... G.H.
„ 25—S. Bookham .... R.C.H.

YELLOW WAGTAIL.

April 7—M. Staines Res. G.C.L., A.H.M.
„ 10—S. Barn Elms Res. E.G.P.
„ 13—E. Walthamstow Res. R.W.P., W.A.W.
„ 16—K. Beckenham ...... P.W.R.
„ 28—H. Croxley Green Moor G.H.

Sept. 1—H. Watford .... G.H.
,, 15—K. Beckenham ...... P.W.R.
,, 21—E. Walthamstow Res. E.M.
Oct. 6—S. Beddington ...... A.H.M.
,, 14—M. Littleton .... J.P.H.

WHITE WAGTAIL.

April 14—K. Elmers End ..... G.E.M.
,, 14—M. Staines Res. ...... G.C.L.
May 2—S. Beddington .... L.P.

RED-BACKED SHRIKE.

April 29—S. Ham Common .. F.R.M.
May 11—M. Ruislip .... G.H.
,, 12—K. Beckenham ...... P.W.R.
,, 16—E. Epping Forest ...... J.R.
Aug. 7—S. Limpsfield .... K.R.C.
,, 10—E. Chingford Marsh E.M.
E. King George V. Res. W.A.W.
Sept. 6—K. Biggin Hill ...... P.W.R.

SPOTTED FLYCATCHER.

April 26—S. Limpsfield .... K.R.C.
,, 28—H. Rickmansworth ... G.H.
May 5—K. Beckenham .... A.J.R.
,, 12—M. Edmonton .... E.M.
,, 22—E. South Weald Park B.T.W., W.A.W.
Sept. 20—S. Sutton .... P.H.T.H.
,, 23—M. Kensington Gardens E.G.P.

PIED FLYCATCHER.

May 10—S. Richmond Park R.E.W.

CHIFFCHAFF.

Mar. 22—K. Dulwich .... W.H.D.
,, 23—M. Northwood .... G.H.
,, 24—E. Knighton Wood B.T.W., W.A.W.
,, 24—S. Richmond Park C.L.C.
S. Claygate .... J.S.W.
,, 31—H. Hamper Mill .... G.H.
Sept. 30—E. Epping Forest ...... J.R.
Oct. 5—M. Hyde Park .... E.G.P.
,, 5—M. Northwood .... G.H.
,, 13—S. Epsom .... R.C.H.

WILLOW WARBLER.

April 7—M. Staines Res. ...... G.C.L.
,, 10—K. Dulwich .... W.H.D.
,, 10—S. Ewell .... R.S.R.F.
,, 11—E. Epping Forest P.H.J., J.R.
Sept. 8—K. Beckenham ...... P.W.R.
,, 15—S. Wimbledon ...... R.E.W.
,, 28—E. King George V Res. E.M.
Oct. 6—H. Moor Park .... G.H.
,, 16—M. Hampstead ...... K.D.-S.

WOOD WARBLER.

April 22—E. Epping Forest ...... E.M.
,, 22—S. Wimbledon ...... R.E.W.
,, 30—M. Ken Wood ...... K.D.-S.
May 10—K. Farnborough ... M.M.H.

GRASSHOPPER WARBLER.

April 19—S. Bookham .... L.P.
S. Epsom .... J.E.R.
,, 28—M. Staines Res. G.C.L., A.H.M.

REED WARBLER.

April 26—S. Beddington .... L.P.
,, 27—E. Walthamstow Res. R.W.P., W.A.W.
Aug. 18—S. Beddington .... R.S.R.F.
Sept. 8—M. Edmonton .... E.M.

SEDGE WARBLER.

April 12—E. Walthamstow Res. E.M.
,, 19—S. Epsom .... R.S.R.F.
,, 23—M. Ruislip .... G.H.
Sept. 4—K. Beckenham ...... P.W.R.
,, 11—M. Kensington Gardens E.G.P.
,, 18—S. Barn Elms Res. E.G.P.

GARDEN WARBLER.

April 13—S. Epsom .... J.S.W.
,, 18—M. Hampstead Heath W.B.W.
,, 22—E. Epping Forest ...... E.M.
,, 30—K. Beckenham ...... P.W.R.
July 28—K. Beckenham ...... P.W.R.
Aug. 17—M. Northwood .... G.H.

BLACKCAP.

April 5—S. Wimbledon ...... R.E.W.
,, 12—E. Chingford .... P.H.J.
,, 14—M. Staines .... G.C.L.
,, 17—K. Dulwich .... W.H.D.
Aug. 31—M. Northwood .... G.H.
Sept. 22—S. Wimbledon ...... R.E.W.

WHITETHROAT.

April 7—S. Ewell .... A.H.H.
,, 14—E. Epping Forest ... B.T.W.
,, 14—M. Staines .... G.C.L.
,, 20—K. Elmers End ...... G.E.M.
,, 28—H. Watford .... G.H.
Sept. 15—H. Watford .... G.H.
,, 18—K. Bickley .... M.M.H.
,, 22—M. Ruislip .... G.H.
,, 27—S. Richmond Park W.L.C.

LESSER WHITETHROAT.

April 23—E. Epping Forest W.A.W.
,, 24—S. Wimbledon ...... R.E.W.
,, 27—M. Ken Wood ...... R.S.R.F.
,, 30—K. Beckenham ...... P.W.R.
Aug. 31—M. Ruislip .... G.H.

FIELDFARE.

April 27—M. Ruislip .... G.H.
,, 28—S. Reigate .... G.W.C.
Oct. 22—S. Wimbledon ...... R.E.W.
,, 26—M. Staines Res. ...... A.H.M.
,, 27—E. Chigwell R.McK.S., W.A.W.
Nov. 6—K. Farnborough ... M.M.H.

REDWING.

Mar. 9—K. Dulwich .... W.H.D.
,, 24—E. Chigwell .... B.T.W.
M. Ruislip .... G.H.
,, 31—S. Beddington .... L.P.
Oct. 20—S. Epsom .... J.S.W.
,, 22—E. Epping Forest ...... J.R.
,, 25—M. Hampstead Heath K.D.-S.
Nov. 6—K. Bromley .... M.M.H.

RING OUZEL.

April 10—S. Headley Down G.W.C.

WHEATEAR.

Mar. 24—S. Wimbledon ... D.A.T.M.
,, 31—H. Sandy Lodge .... G.H.
E. Epping Forest .... F.J.J.
April 6—M. Ruislip .... G.H.
,, 10—K. Beckenham ...... P.W.R.
Sept. 26—E. Epping Forest .... F.J.J.
Oct. 2—M. Littleton Res. ... J.P.H.
,, 12—S. Beddington ...... P.W.R.
Nov. 3—K. Beckenham ...... P.W.R.

WHINCHAT.

April 10—M. Regent's Park ... M.R.
,, 20—E. King George V Res. W.A.W.
,, 25—S. Epsom .... A.H.H.
May 5—K. Beckenham G.E.M., P.W.R.
Sept. 14—M. Edmonton .... E.M.
,, 18—S. Barn Elms Res. E.G.P.
,, 21—E. Epping Forest .... F.J.J.
Oct. 20—K. Beckenham ...... P.W.R.

REDSTART.

April 11—S. Richmond Park C.L.C., R.E.W.
,, 13—E. Chingford Marsh F.J.J.
E. Epping Forest B.T.W.
,, 18—M. Hampstead Heath W.B.W.
,, 22—K. Beckenham ...... P.W.R.
Sept. 1—S. Ashtead .... J.S.W.
,, 9—E. Epping Forest ... F.J.J.
,, 16—K. Westerham ...... P.W.R.
,, 25—M. Kensington Gardens E.G.P.

NIGHTINGALE.

April 13—E. Epping Forest ... B.T.W.
,, 18—S. Epsom Downs ... A.H.H.
,, 19—M. Northwood .... G.H.

SWALLOW.

Mar. 28—S. Thornton Heath ... L.P.
April 6—M. Ruislip .... G.H.
,, 7—K. Beckenham G.E.M., P.W.R.
,, 12—E. Epping Forest ... P.H.J.
,, 14—H. Hamper Mill .... G.H.
Oct. 5—B. Iver .... R.S.R.F.
,, 6—H. Hamper Mill .... G.H.
,, 13—E. Chigwell .... W.A.W.
,, 19—M. Staines Moor .... F.R.F.
,, 20—K. Bickley .... M.M.H.
,, 31—S. Leatherhead ... P.H.T.H.

MARTIN.

April 11—S. Beddington ...... P.W.R.
,, 12—K. Beckenham ...... P.W.R.
,, 13—E. Chingford Marsh F.J.J.
,, 13—M. Ruislip .... G.H.
M. Staines .... C.W.G.P.
,, 14—H. Sandy Lodge .... G.H.
Oct. 5—B. Iver .... R.S.R.F.
,, 6—H. Hamper Mill .... G.H.
,, 11—K. Bickley .... M.M.H.
,, 15—M. Hampton Court J.E.R.
Nov. 1—S. Mickleham .... P.H.T.H.
,, 2—E. Loughton .... P.D.H.

SAND MARTIN.

Mar. 24—M. Ruislip .... G.H.
April 10—S. Barn Elms Res. E.G.P.
,, 14—H. Watford .... G.H.
,, 20—E. King George V Res. W.A.W.
Sept. 21—E. King George V Res. W.A.W.
,, 22—M. Ruislip .... G.H.
Oct. 6—K. Beckenham ...... P.W.R.
,, 12—S. Beddington ...... P.W.R.

SWIFT.

April 13—M. Staines Res. ... C.W.G.P.
,, 21—E. Walthamstow Res. R.W.P.
,, 28—H. Rickmansworth ... G.H.
K. Beckenham ...... G.E.M.
S. Limpsfield .... K.R.C.
Sept. 1—E. Chingford .... E.M.
,, 10—S. Beddington ...... P.W.R.
Oct. 5—M. Staines Res. ..... A.H.M.
,, 6—K. Westerham ...... M.M.H.

NIGHTJAR.

May 5—S. Esher .... L.P.
,, 26—M. Ruislip .... G.H.
Sept. 4—M. Ruislip .... G.H.

WRYNECK.

April 13—S. Tadworth .... H.B.
,, 27—M. Northwood .... G.H.
Aug. 18—M. Northwood .... G.H.

CUCKOO.

April 11—S. Cobham
Field, 4296, Vol. clxv.
,, 14—M. Staines Res. ...... G.C.L.
,, 17—K. Bickley .... M.M.H.
,, 19—E. Epping Forest
R.W.P., R.McK.S., W.A.W.
Sept. 3—S. Stoneleigh .... J.S.W.

GOLDENEYE.

April 5—S. Molesey .... P.A.D.H.
June 2—M. Staines Res. ...... F.R.F.
Oct. 25—M. Staines Res. ..... A.H.M.
Nov. 30—S. Molesey .... P.A.D.H.

GOOSANDER.

Mar. 30—S. Richmond Park C.L.C.
April 6—E. King George V Res.
W.A.W.
,, 13—M. Littleton Res. P.A.D.H.
Oct. 26—M. Staines Res. ...... A.H.M.
Dec. 13—S. Barn Elms Res. J.P.H.
S. Richmond Park R.E.W.
,, 22—E. Walthamstow Res.
E.T.N.

SMEW.

Mar. 16—S. Lonsdale Road Res.
G.C.L.
,, 17—M. Staines Res.
G.C.L., A.H.M.
April 6—E. King George V Res.
W.A.W.
Nov. 30—S. Molesey .... P.A.D.H.
Dec. 22—E. Walthamstow Res.
E.T.N.

TURTLE DOVE.

April 26—S. Limpsfield .... K.R.C.
May 3—M. Regent's Park ...... M.R.
,, 4—K. Keston .... G.E.M.
,, 5—E. Knighton Wood W.A.W.
,, 5—H. Hamper Mill .... G.H.
Sept. 29—M. Ruislip .... G.H.
Oct. 1—S. Sutton .... P.H.T.H.
,, 6—K. Beckenham ...... P.W.R.

STONE CURLEW.

April 14—S. Richmond Park F.R.M.

COMMON SANDPIPER.

April 13—E. Walthamstow Res.
R.W.P., W.A.W.
,, 14—M. Staines Res. ...... G.C.L.
,, 20—S. Gatton Park .... H.B.
Sept. 21—E. King George V Res.
W.A.W.
Oct. 11—S. Barn Elms Res. E.G.P.

CORNCRAKE.

April 19—E. Chigwell .... R.McK.S.

BRITISH MUSEUM NATURAL HISTORY
PRESENTED
25 MAY 1936

87. ALISMACEAE.

ALISMA Linn. 455.

1933. **A. Plantago-aquatica** Linn. *Water Plantain.*

In all divisions except 10, 14, 18, and 23.

1934. **A. lanceolatum** With.

2. Sparingly in canal near Rickmansworth. Perhaps a variety of 1933.

1935. **A. ranunculoides** Linn.

13. West End Common, Esher. 14. Richmond Park, near Ham Gate. 20. Chislehurst Common.

SAGITTARIA Linn. 457.

1937. **S. sagittifolia** Linn. *Arrow-head.*

Along the rivers Thames, Colne, Lea and Roding in divisions 1 to 4, 8 to 10, 13 and 14. Also 6. Canal at Islington. 21. Dartford Marsh.

DAMASONIUM Hill. 458.

1939. **D. Alisma** Mill.

13. Oxshott Heath (L.B.H.). 17. Chipstead. Headley.

BUTOMUS Linn. 459.

1940. **B. umbellatus** Linn. *Flowering Rush.*

1. Grand Junction Canal, Langley. 3. Uxbridge. Hampton Court Park. 4. R. Colne, Harefield. Mill Hill. R. Brent at Hanwell. 5. Colney Heath. 8. Frequent along the R. Lea. 9 and 10. River Roding. 22. Wilmington Mill. 23. Shoreham.

88. NAIADACEAE.

TRIGLOCHIN Linn. 460.

1942. **T. maritimum** Linn. *Sea Arrow-Grass.*

12. West Thurrock Marsh. Grays. 22. Swanscombe Marshes. Stone Marshes.

POTAMOGETON Linn. 462. *Pondweeds.*

1944. **P. natans** Linn.

Recorded in divisions 1, 4, 5, 7, 8, 9, 10, 13 to 17, 19, 20.

1945. **P. polygonifolius** Pourr.

9. Epping Forest. 13. Black Pond, Esher Common. 19. Moorhouse near Limpsfield. 20. Keston Bog. Doubtless in others; a widespread species.

1953. **P. lucens** Linn.

8. Waltham Abbey. 22. Between Shoreham and Eynsford.

1958. **P. perfoliatus** Linn.

3. West Drayton. 4. Harefield. 5. Napsbury. 13. Weybridge.

1959. **P. crispus** Linn.

Records in divisions 1, 5, 9, 13, 14, 17, 18, 19, 21 and 24. Usually in ponds.

1960. **P. densus** Linn.

1. Colnbrook. 2. Chalfont St Giles. 5. Colney Heath. 24. Near Brasted.

1963. **P. obtusifolius** Mert. & Koch.

13. Near Weybridge.

1970. **P. pectinatus** Linn.

4. Canal near Harefield. 8. River Lea, Cheshunt. 20. Keston Ponds.

ZANNICHELLIA Linn. 464.

1975. **Z. palustris** Linn.

15. Leatherhead Millpond. 19. Pond near Titsey.

1976. **Z. pedunculata** Reichb.

12. Rainham.

APONOGETON Linn.

† **A. distachyum** Thunb. *Cape Pond-weed.*

20. Keston upper pond. An alien from South Africa.

90. CYPERACEAE.

ELEOCHARIS Br. 469.

1988. **E. palustris** Roem. & Schult.

Recorded in divisions 3, 4, 5, 7, 9, 14, 15, 17, 19 to 22 and 24.

1990. **E. multicaulis** Sm.

9. Epping Forest. 14. Richmond Park. 19. Itchingwood Common, Limpsfield. 20. Keston Bog.

SCIRPUS Linn. 470.

1992. **S. caespitosus** Linn. *Deer's Grass.*

20. Keston Bog, " one clump 1914-1919," W.W.

1993. **S. fluitans** Linn.

4. Stanmore Marsh. 9. Snaresbrook Heath. Pond near Fairmead, Epping Forest. 13. Black Pond, Esher. 20. Keston Ponds.

1996. **S. setaceus** Linn.

4. Pinner. 9. Great Gregories, Epping. 19. Moorhouse, Limpsfield. 20. Chislehurst Common. Darrack Wood, Orpington.

1998. **S. lacustris** Linn. *Bulrush.*

Recorded in divisions 1 to 5, 7 to 10, northern, 14 and 15 southern. The southern streams are mostly too shallow for this large species.

2000. **S. triqueter** Linn.

14. River Thames at Mortlake and Kew.

2002. **S. maritimus** Linn. *Sea Club-rush.*

12. West Thurrock Marsh. Grays. 14. Kew. 22. Dartford Marshes.

2003. **S. sylvaticus** Linn.

5. Bishops Wood, Highgate. 13. Weybridge. 14. Wimbledon Common. 19. Oxted. Itchingwood Common, Limpsfield. 22. Near Eynsford. 24. Westerham.

ERIOPHORUM Linn. 471.

2008. **E. angustifolium** Roth. *Cotton Grass.*

4. Harefield. 9. Wood Street Bog and High Beach in Epping Forest. 13. Esher Common. 14. Wimbledon Common (also var. *elatius* Koch). 20. Keston.

CAREX Linn. 476. *Sedge.*

2024. **C. divisa** Huds.

21. Swanscombe Marshes. Stone Marshes.

2026. **C. disticha** Huds.

13. Near Weybridge. 14. Wimbledon Common. 21. Swanscombe and Stone Marshes.

2030. **C. paniculata** Linn.

2. Rickmansworth. 3. West Drayton. 7. Broxbourne. 8. By River Lea. 13. Weybridge. 14. Wimbledon Common. 19. Several stations.

2031. **C. vulpina** Linn. *Fox Sedge.*

Freely recorded in divisions 1, 3, 4, 7, 9, 12 to 15, 17, 19, 20, 21. Not unlikely to be found in all.

2033. **C. contigua** Hoppe (**muricata** Linn.).

3. Near Shepperton. 5. Elstree. 6. Crouch End. Highgate Woods. 17. Chipstead. Fetcham Downs. 19. Limpsfield. 20. West Wickham. Orpington.

2035. **C. divulsa** Stokes.

Widely distributed on hedgebanks, etc. In all divisions except 8, 10, 13, 19, 22 to 24. Probably in these also.

2036. **C. echinata** Murr.

4. Between Ruislip and Harefield. 9. Theydon, Epping Forest. 11. Wimbledon Common. 19. Moorhouse, Limpsfield. 20. Pauls Cray Common. Hayes.

2037. **C. remota** Linn.

6. Highgate Woods. Hampstead Heath. Also recorded in divisions 1, 3, 5, 7, 9, 13, 17, 19, 20 and 24.

× **vulpina** (**axillaris** Good.).

15. Green lane near Banks Common, Effingham. 20. Darrack Wood, Orpington.

2038. **C. elongata** Linn.

13. Weybridge (L.B.H.).

2041. **C. leporina** Linn. (**ovalis** Good.).

Frequent in damp places on commons and heaths. Records in divisions 4, 6, 9, 10, 13, 14, 15, 17, 19, 20, 22, and 24.

2046. **C. gracilis** Curt. **(acuta).**

1. Langley. 3. River Thames from Kingston Bridge to Hampton. 13. Weybridge. Near Thorpe.

2053. **C. Goodenowii** Gay.

4. Several stations. 6. Hampstead Heath. 7. Hadley Common. 9. Epping Forest. 13. Weybridge. 15. Banks Common. 17. Epsom. 19. Near Moorhouse. Itchingwood Common.

2054. **C. diversicolor** Crantz **(flacca** Schreb.**).**

Frequent in pastures, downs, etc., particularly on the south side. Abundant on the chalk. Records in divisions 2, 4 to 7, 9, 13, 15, 17 to 19, 21, 23, and 24.

2062. **C. pilulifera** Linn.

4. Batchworth Heath. Stanmore Heath. 6. Queens Wood, Highgate. 9. Cooks Folly Wood. High Beach. 16. Springpark Wood, Addington. 17. Headley Heath. Epsom. 19. Limpsfield Common.

2064. **C. caryophyllea** Latour **(verna** Chaix**).**

Frequent in pastures and commons. Records in divisions 4, 7, 9, 11, 14 to 19, 23.

2066. **C. pallescens** Linn.

6. Highgate Woods (near railway carriage sheds). 19. Woods between Moorhouse and Titsey. 20. Crofton. Holwood Park. Sidcup. Keston.

2067. **C. panicea** Linn. *Carnation Sedge.*

9. Epping Forest, near Theydon. 15. Banks Common. Leatherhead. Great Bookham Common. 17. Box Hill (L.B.H.). 19. Moorhouse.

In wet places. Surely more frequent than the above records suggest.

2071. **C. pendula** Huds.

This fine species, the most striking of our sedges, is recorded in divisions 2, 4, 6 (Highgate Woods, 1902), 7, 8, 9, 17, 19, and 22. It is plentiful in the Hertfordshire woodlands, division 7; the Ongar district, division 9; and in the Holmesdale division (19). It is apparently absent from Epping Forest.

2072. **C. strigosa** Huds.

17. Wood at foot of Colley Hill, Reigate. 19. Oxted Woods. Limpsfield. 20. Crofton Woods, near Orpington. [24. Plentiful at Crockham Hill, just beyond the radius].

2074. **C. sylvatica** Huds. *Wood Sedge.*

Plentiful in many woods, but no records in divisions 1, 3, 4, 5, 8, 10, 12, 13, 14, 16, and 21. Scarcer on the northern side.

2075. **C. helodes** Link **(lævigata** Sm.**).**

19. Moorhouse, near Limpsfield.

2076. **C. binervis** Sm.

6. Hampstead Heath. 9. Epping Forest (common). 13. Abrook. 19. Itchingwood Common. 20. Chislehurst. Keston. Holwood Park.

2081. **C. flava** Linn.

5. Napsbury. 9. Epping Forest near Theydon.

2083. **C. Oederi** Retz.

19. Limpsfield Common (var. *oedocarpa* And.). 20. Holwood Park (var. *elatior* And.).

2085. **C. hirta** Linn. *Hairy Sedge.*

Generally common. Records in divisions 2, 3, 4, 6 to 9, 11, 13 to 17, 19, 24. Var. *hirtæformis* Pers. has been noted in divisions 13 and 16.

2086. **C. Pseudo-Cyperus** Linn.

4. Whitchurch Common. 7. Wormley. Broxbourne. 9. Epping Forest, near the Wake Arms and at Ambresbury Banks. 11. Little Warley. 13. Frequent. 19. Barrow Green, Oxted. 20. Abbey Wood. 24. Dunton Green.

2087. **C. acutiformis** Ehrh. **(paludosa** Good.**)**.

2. Rickmansworth. Denham. 3. West Drayton. 7. Broxbourne. 8. Waltham. 9. Near Walthamstow. 13. Weybridge. 15. Leatherhead Mill Pond. 19. Oxted Mill.

2088. **C. riparia** Curt.

Ponds and riversides in divisions 1, 2, 3, 5, 7, 8, 9, 12, 13, 14, 20 and 21.

2090. **C. vesicaria** Linn.

2. Near Denham. 4. Totteridge. 5. Colney Furze Field. 6. Highgate Woods 1905 (one very fine tuft). 13. Between Weybridge and New Haw. 21. Dartford Marsh.

91. GRAMINEAE.

PANICUM Linn. 477.

2094. **P. Crus-Galli** Linn.

12. Grays. Alien. European.

† **P. miliaceum** Linn. *Millet.*

2. Denham. Near Uxbridge. 3. West Drayton. 4. Uxbridge. 12. Grays. Dagenham. 24. Near Otford Station.

On rubbish heaps, etc. Alien from warm countries.

SETARIA Beauv. 478.

2096. **S. viridis** Beauv.

Records in divisions 2, 3, 4, 6, 9, 11, 12 and 15.

An European alien more or less established in places.

PHALARIS Linn. 481.

2103. **P. canariensis** Linn. *"Canary Grass."*

Records in divisions 1, 2, 3, 4, 7, 8, 13, 14, 19, 21, 23 and 24.

In waste places. An alien from North Africa.

2106. **P. arundinacea** Linn.

Plentiful in wet places. Recorded in all divisions except 10, 11, 18 and 24.

The variegated form is the "Ribbon Grass" of gardens, which has been found as an escape in division 13.

ANTHOXANTHUM Linn. 482.

2107. **A. odoratum** Linn. *Sweet Vernal Grass.*

Recorded freely in every division except 1 (Colnbrook), 10 (Hainault) and 21 (Kent Marshes).

The chief scent constituent of new-mown hay.

ALOPECURUS Linn. 484.

2110. **A. myosuroides** Huds.

Frequent in cultivated fields. Records in divisions 1, 3, 5, 9 to 12, 15 to 19, 21.

2111. **A. fulvus** Sm.

4. Ruislip reservoir. 9. Epping Forest, near "Rising Sun." Goldings Hill Pond. 20. Hayes Common.

2112. **A. geniculatus** Linn.

Plentiful in wet grassy places, though not yet recorded from divisions 1, 8, 10, 11, 22 and 24. Probably in all.

2114. **A. pratensis** Linn. *Foxtail Grass.*

Records in all divisions except 24 (Westerham), where it certainly occurs.

MILIUM Linn. 485.

2116. **M. effusum** Linn. *Millet Grass.*

2. Denham. 6. Highgate Woods. 7. Wormley. Essendon. 8. Broxbourne. 9. Highams Park. Theydon Garnon. 11. Kelvedon Hatch. 17. Chipstead. Near Coulsdon. 19. Clackets Green. Oxted. 20. Crofton. Sidcup. 22. Joydens Wood. Southfleet. 23. Shoreham. Cudham.

Local in shady places.

PHLEUM Linn. 486.

2119. **P. pratense** Linn. *Timothy Grass.*

General in meadows. All divisions except 8 (Lea Valley) and 10 (Hainault).

The variety *nodosum* Linn. is frequent on the chalk.

AGROSTIS Linn. 488.

2124. **A. canina** Linn.

3. Hampton Court. 5. North Mimms. 6. Highgate Wood 7. Essendon. 9. Epping Forest. 13. Abrook Common. 17. Between Chipstead and Tadworth. 18. Coulsdon. 19. Oxted. 20. Chislehurst Common.

In heathy places.

2125. **A. alba** Linn. *Fiorin Grass.*

Records in all divisions except 1, 2, 5, 10, 21, and 24. Common and variable.

2126. **A. tenuis** Sibth. **(vulgaris** With.**)**. *Bent Grass.*

All divisions except 2, 5, 12, 15, 16, and 23.

POLYPOGON Desf. 489.

2129. **P. monspeliensis** Desf.

3. Canal at West Drayton (L.B.H.). Evidently casual here.

CALAMAGROSTIS Roth. 490.

2130. **C. epigeios** Roth. *Small Reed.*

9. Larks Wood, Chingford. 11. Brentwood Common.

APERA Adans. 492.

2135. **A. Spica-venti** Beauv.

1. Langley. 2. Rickmansworth. 4. Ickenham. 6. Southgate. 7. Wormley. Broxbourne. 9. Hale End. High Beach. 13. Several records. 17. Fetcham. Walton on the Hill.

In cultivated fields. Apt to be fugitive.

AMMOPHILA Host. 493.

2137. **A. arenaria** Link. *Marram Grass.*

4. This maritime grass was reported planted on the bunkers of Northwood Golf Links in 1913.

AIRA Linn. 495.

2140. **A. caryophyllea** Linn.

Scattered records in divisions 2, 4, 5, 7, 9, 12, 13, 15, 17, 19, and 20.

2141. **A. praecox** Linn. *Early Hair-grass.*

Generally plentiful in dry sandy places. No records from divisions 1, 2, 5, 8, 10, 12, 16, 21, and 23.

DESCHAMPSIA Beauv. 497.

2143. **D. caespitosa** Beauv. *Tussock Grass.*

Frequent in wet grassland, woods, etc. Not recorded in divisions 2, 3, 8, 12, 16, 18, 21, and 24.

2146. **D. flexuosa** Trin.

4. Harrow Weald Common. 6. Highgate. Hampstead. Winchmore Hill. 9. Epping Forest. 11. Thorndon Park. And all southern divisions (13 to 24) except 15 (Chessington) and 21 (Kent Marshes). In dry heathy places and woods.

HOLCUS Linn. 498.

2147. **H. mollis** Linn. *Soft-grass.*

Recorded in divisions 1, 2, 4, 5, 6 (Hampstead, Highgate, etc., plentiful), 7 to 11, 13, 14, 15, 19, and 20. Avoids the chalk.

2148. **H. lanatus** Linn. *Yorkshire Fog.*

Many records in all divisions except 1 (Colnbrook) and 24 (Westerham), in which it is unlikely to be absent.

TRISETUM Pers. 499.

2149. **T. flavescens** Beauv. *Yellow Oat.*

Common in dry pastures. No records in divisions 10 (Hainault) and 11 (Brentwood).

AVENA Linn. 500.

2150. **A. pubescens** Huds.

13. Near Weybridge. 18. Above Oxted Chalkpit.

2151. **A. pratensis** Linn.

17. Epsom Downs. Banstead Downs. 18. Farthing Downs. 23. E. of Eynsford. Downe.

ARRHENATHERUM Beauv. 501.

2154. **A. elatius** Mert. & Koch **(avenaceum** Beauv.**)**. *False Oat.*
Abundant in hedgebanks, etc. Recorded in every division.

CYNODON Rich. 502.

2156. **C. Dactylon** Pers.

8. A large well-established patch was discovered by Rev. P. H. Cooke in the neighbourhood of the Docks in 1934.

SIEGLINGIA Bernh. 503.

2157. **S. decumbens** Bernh.

4. Stanmore Heath. Ruislip. 5. Colney Heath. 6. East Heath, Hampstead. 9. Epping Forest, frequent. In the southern area scattered records in divisions 14 to 20 and 24.

PHRAGMITES Adans. 504.

2158. **P. communis** Trin. *Reed.*

Records in every division except 10 (Hainault), 18 (Caterham) and 24 (Westerham). Probably found in all, except 18. The records are not numerous and the Reed appears to be local except in 8 (Lea Valley) and 21 (Kent Marshes).

CYNOSURUS Linn. 506.

2160. **C. cristatus** Linn. *Dog's-tail Grass.*

Generally plentiful in pastures and roadsides, but no records in divisions 3, 8, 10 and 12.

2161. **C. echinatus** Linn.

In gravel pits and waste places, adventive and fugitive. Recorded in divisions 3, 4, 7, 12, 13, 14, 17, 19 and 21.

KŒLERIA Pers. 507.

2164. **K. gracilis** Pers., var. **britannica** Domin **(K. cristata)**.
17. Mickleham Downs. 18. Riddlesdown. 23. Downe.
On the chalk, but quite local.

MOLINIA Schrank. 508.

2165. **M. cœrulea** Moench. (**M. varia** Schrank). *Purple Moor Grass.*

1. Black Park. 4. Stanmore Heath. 5. Near Aldenham. 6. Hampstead Heath. 9. Epping Forest, many records. Roydon. 11. Hainault Forest. 13. Oxshott. Esher Common. 14. Richmond Park. Wimbledon Common. 16. Shirley. Wandsworth Common. 17. Walton Heath. 19. Reigate Heath. 20. Hayes Common. Chislehurst Common.

CATABROSA Beauv. 509.

2166. **C. aquatica** Beauv.

1. Colnbrook. 13. Weybridge. 14. Richmond Park, near Ham Gate. In ponds and ditches.

MELICA Linn. 510.

2168. **M. uniflora** Retz. *Melic Grass.*

Frequent in woods and shady hedgerows, but absent from many districts. No records in divisions 3, 8, 10, 12 to 15, and 21. Apparently absent from Epping Forest.

DACTYLIS Linn. 511.

2169. **D. glomerata** Linn. *Cock's-foot Grass.*

Abundant in every division.

BRIZA Linn. 512.

2171. **B. media** Linn. *Quaker Grass. Totter Grass.*

1. Iver. 2. Rickmansworth. 4. Harefield. 5. Warren Gate. Colney Furze Field. 6. Finchley Common. 9. Stapleford Tawney. 19. Oxted. 20. Keston. 17, 18 and 23. Plentiful on the chalk.

Dry pastures; not common, except on the chalk.

POA Linn. 513.

2173. **P. annua** Linn. *Annual Meadow Grass.*

There is no record of this ubiquitous and world-spread plant in division 10 (Hainault), but there is no doubt of its presence there. The grasses in general are not so well recorded in the northern as in the southern section of our district.

2180. **P. nemoralis** Linn.

Dryish shady places; in all divisions except 3, 11, 12 and 21.

2181. **P. compressa** Linn.

1. Near Langley. 4. Totteridge. Above Harefield Quarry. 6. Churchyard Bottom Wood. North Hill, Highgate (1903). 7. Hertingfordbury. 14, Richmond, on a wall. 19. Wall in Limpsfield. 21. Northfleet. 22. Crayford.

2182. **P. Chaixii** Vill.

19. Plentiful in an orchard at Limpsfield. A handsome grass.

2183. **P. pratensis** Linn. *Meadow Grass.*

No records of this ubiquitous meadow plant in divisions 5 and 24, though of course it is there. Var. *angustifolia* Linn. has been recorded from 17. Ashtead and 20. Holwood.

2186. **P. trivialis** Linn.

Another species, universal in Britain, of which there are no records in divisions 2, 5 and 10.

GLYCERIA Br. 514.

2187. **G. fluitans** Br. *Floating Grass.*

In watery places. Records in all divisions except 8 and 24, both likely to have it.

× **plicata (pedicellata** Towns.**).**

9. Margin of ponds at Woodford. 20. Darrick Common, near Farnborough. 22 and 23. River Darenth at Eynsford.

2188. **G. plicata** Fr.

6. Highgate Woods. 17. Tadworth. 19. Limpsfield. 20. Chislehurst Common. 23. Shoreham.

Records imperfect.

2189. **G. declinata** Bréb.

9. Pond at Woodford, Epping Forest. 18. Coldharbour Beeches near Titsey. 19. Limpsfield (*teste* C.E.S.). 20. Pauls Cray Common.

2190. **G. aquatica** Wahlb.

1. Plentiful. 2. Cassio Bridge. 3. and 4. Plentiful. 5. London Colney. Elstree Reservoir. 6. West Heath, Hampstead. 9. Wood Street, Epping Forest. 12, 13, 14 and 15. Plentiful. 19. Godstone. 21. Stone Marshes. 22. Crayford. 23. Shoreham.

2191. **G. maritima** Mert. & Koch.

12. Grays. 21. Stone Marshes.

On the lower Thames marshes.

2193. **G. distans** Wahlb.

10. Between Ilford and Barking (R. Roding). 12. Rainham. Purfleet. 21. Dartford Marsh.

FESTUCA Linn. 515.

Authorities hold different views upon the limits of both species and genera among the Fescue Grasses and their allies. This list follows the *London Catalogue*, Edn. XI. Our recorders have barely touched the segregates of the *F. ovina* group.

2196. **F. rigida** Kunth.

Recorded in divisions 1, 3, 4, 12, 14, and 17 to 23.

This pleasing little grass, occurring on walls and in dry sunny places, is much commoner south of the Thames.

2197. **F. rottboellioides** Kunth **(loliacea** Huds.**).**

12. Rainham. Purfleet.

2201. **F. Myuros** Linn. *Wall Fescue.*

4. Stanmore. Canons Park. 7. Hoddesdon. 12. Purfleet. 19. Near Limpsfield. 20. Chislehurst Common.

2202. **F. bromoides** Linn. **(sciuroides** Roth**).**

1. Near Langley. 4. Elstree. Whitchurch Common. 7. Broxbourne. 9. Hale End. Epping Forest. 11. Warley Common. 12. Purfleet. 15. Ashtead. 17. Frequent. 19. Limpsfield. 20. Chislehurst Common. 21. Dartford Marsh.

2203. **F. capillata** Lam.

20. Keston (W.W.). Probably not rare.

2204. **F. ovina** Linn. *Sheep's Fescue.*

6. Highgate. Hampstead Heath. 9. Epping Forest. 11. Brentwood Common. And in the southern divisions, 13, 14, 16, 17, 19, 20, and 23, on heaths and commons.

2207. **F. glauca** Lam.

20. Chislehurst Common (*teste* W.W.).

2209. **F. rubra** Linn.

Common in light soils. Roots creeping. Records in divisions 1, 3, 4, 6, 9, 12, 15, 17, 19, 20, 21, and 24.

2210. **F. fallax** Thuill.

9. Snaresbrook. 11. Brentwood Common.

2213. **F. pratensis** Huds.

1. Langley. 4. Totteridge. 6. North Hill, Highgate. 17. Near Headley. Between Chipstead and Tadworth. 19. Limpsfield. 20. Chislehurst.

In damp meadows. Common.

× **Lolium perenne (F. loliacea** Curt.**).**

14. Near Weybridge.

2214. **F. elatior** Linn.

Recorded in divisions 1, 2, 3, 9, 12 to 17, 19, and 21.

In similar situations to 2213, and not very distinct from it.

f. *pseudo-loliacea* Hackel.

3. Tow-path near Hampton Court.

2215. **F. arundinacea** Schreb.

9. Hale End, on allotments (casual). 14. New Haw, near Weybridge.

BROMUS Linn. 516. *Brome Grass.*

2216. **B. giganteus** Linn.

Recorded in divisions 2 to 9 (northern) and 14, 17, 19, 20, and 23 (southern). On stiff soils, commoner in the northern section.

2217. **B. ramosus** Huds. **(asper** Murr.**).**

In all divisions except 1, 8, 10, 11, 12, 15, 21, 23, and 24. Frequent in woods.

2218. **B. erectus** Huds.

4. Bushey, on railway embankment. Harefield. 21. Dartford. 17, 18, 22, and 23. Abundant on the chalk.

The conspicuous tall grass of open chalk slopes, to which it is almost confined.

2223. **B. sterilis** Linn.

Recorded in all divisions except 5, 10, and 24. Probably in all.

2224. **B. secalinus** Linn.

4. Near Oxhey Woods, Watford. 13. Weybridge. 19. Cornfield at Limpsfield.

2225. **B. racemosus** Linn.

19. Damp meadows at Limpsfield.

2226. **B. commutatus** Schrad.

14. Near Weybridge. A common species, evidently overlooked.

2228. **B. hordeaceus** Linn. **(mollis** Linn.**)**. *Soft Brome.*

Abundant in fields, roadsides, etc. Records in every division except 5, 10, 18 and 24.

2231. **B. arvensis** Linn.

4. Canons Park, Edgware.

† **B. unioloides** H.B.K.

12. Purfleet. Alien. American.

† **B. brizaeformis** Fisch.

1. Langley. Alien. Caucasus.

BRACHYPODIUM Beauv. 517.

2232. **B. sylvaticum** Roem. & Schult. *False Brome.*

In all divisions except 1, 10, 12, 21 and 24.

2233. **B. pinnatum** Beauv.

15. Epsom. 17. Epsom Downs. Banstead Downs. Mickleham Downs (var. *corniculatum* Lam.). 20. Chislehurst (W.W.). 22. Dartford Road.

LOLIUM Linn. 518.

2234. **L. perenne** Linn. *Rye-Grass.*

Abundant and recorded in every division.

2235. **L. multiflorum** Lam. *Italian Rye-Grass.*

Cultivated, and recorded as an escape in divisions 1 to 3, 6 to 8, 11, 12 and 17 to 22.

2237. **L. temulentum** Linn. *Darnel.*

1. Langley. 6. Golders Green. 7. Great Amwell. 13. Weybridge.

AGROPYRON J. Gaertn. 519.

2238. **A. caninum** Beauv.

4. Hendon. 5. Napsbury. 6. Church End, Finchley. 17. Leatherhead. Epsom Downs. 20. Elmstead. 23. S. of Downe.

2240. **A. repens** Beauv. *Couch Grass, Quitch.*

Only too abundant on cultivated ground, but not recorded from divisions 2 (Rickmansworth) or 18 (Caterham).

2242. **A. pungens** Roem. & Schult.

21. Dartford Marshes.

A. junceum × **repens** (**A. acutum** auct.).

12. Abundant at West Thurrock Marsh.

LEPTURUS Br. 520.

2244. **L. filiformis** Trin.

21. Dartford Marshes.

NARDUS Linn. 521.

2246. **N. stricta** Linn. *Mat-grass.*

4. Whitchurch Common. Stanmore Heath. 9. Plentiful in Epping Forest. 14. Richmond Park. Wimbledon Common. 16. Shirley. 17. Tadworth. 19. Reigate Heath. Moorhouse, Limpsfield.

Generally abundant where it occurs, but restricted to damp moory places.

HORDEUM Linn. 522.

2248. **H. nodosum** Linn. *Meadow Barley.*

Local but widely distributed on damp meadow land. Recorded in all divisions except 2, 5, 10, 12, 16, 18 and 23.

2249. **H. murinum** Linn. *Wall Barley.*

An abundant roadside weed, but without record in divisions 10 and 18.

2250. **H. marinum** Huds. *Sea Barley.*

12. Grays. Rainham. 21. Stone Marshes. Dartford Marsh.

In our two "maritime" divisions on the lower Thames.

92. CONIFERAE.

JUNIPERUS Linn. 524.

2252. **J. communis** Linn. *Juniper.*

Frequent on the chalk slopes in divisions 17 (Banstead), 18 (Caterham) and 23 (North Downs, Kent). Also at 19. Limpsfield Common. 24. Crockham Hill.

TAXUS Linn. 525.

2254. **T. baccata** Linn. *Yew.*

The Yew is native and plentiful on the chalk in divisions 17, 18 and 23, at times forming woods, as between Leatherhead and Mickleham. Trees, probably wild, are occasionally seen in divisions 4, 19, 20, 22, and 24. It is also recorded in divisions 2, 3, 6, 7, 8, 13 and 15, often in churchyards. The largest and oldest Yew in the Society's District is probably that standing in Tandridge Churchyard (19).

PINUS Linn. 526.

2255. **P. sylvestris** Linn. *Pine, Scots Fir.*

The Pine is not native in the district, and in the northern divisions only planted trees are recorded. There are extensive pine-woods where the tree is fully naturalised in divisions 13. Weybridge. Oxshott. Esher, etc. 19. Tilburstow Hill. Limpsfield Chart. 20. Keston, etc. 24. Crockham Hill. Brasted Chart, etc.; and the Pine is recorded from all other southern divisions except 18 and 21.

† **Larix decidua** Mill.

There are a few records of the Larch, but only as a planted tree.

93. FILICES.

PTERIS Linn. 530.

2261. **P. aquilina** Linn. *Bracken.*

This world-spread and dominant plant is recorded in every division, although it dislikes lime. It has even found a corner in Kent Marshes, division 21, near Dartford.

BLECHNUM Linn. 532.

2263. **B. Spicant** With. *Hard Fern.*

1. Black Park Wood. 9. Epping Forest, near Monks Wood (1909), a few plants only. 13. Oxshott Heath. 19. Moorhouse. 20. Holwood. 24. Crockham Hill Common.

Rapidly decreasing.

ASPLENIUM Linn. 533.

2266. **A. Adiantum-nigrum** Linn. *Black Spleenwort.*

1. Near Iver. 7. Near Wormley. Broxbourne. 12. Wall of Eastbury Manor, Barking. 17. Headley Lane. Mickleham. 19. Barrow Green, Oxted. 23. Cudham. 24. Chevening.

On old walls, except in 19 and 24, where it is rare on dry hedgebanks.

2269. **A. Trichomanes** Linn. *Maidenhair Spleenwort.*

2. Denham. 4. Wall opposite Moor Park. 9. Old wall in Blake Hall Road, Wanstead (1907). 19. Wall in Limpsfield village. 23. Cudham. Eynsford.

2270. **A. Ruta-muraria** Linn. *Wall Rue.*

A good many records of this little fern on walls in divisions 1 to 4, 6 (Hampstead Lane. Caen Wood Towers), 7, 14, 17, 23, and 24. It is probably most frequent in 24 (Westerham division).

ATHYRIUM Roth. 534.

2273. **A. Filix-foemina** Roth. *Lady Fern.*

14. Near Oxshott. 19. Chart Woods, Limpsfield. S. of Limpsfield Common.

The Lady Fern is common a few miles south of our area, but the few plants referred to above are all that are known within the radius.

There is an old record "Scattered about the Forest" (Epping), but the writer, in over 40 years, has never seen it there.

CETERACH Willd. 535.

2276. **C. officinarum** Willd. *Scaly Spleenwort, Rusty-back.*

3. Harmondsworth (1920). 4. Perivale Churchyard (1920). Near Harefield (1909). 7. Great Amwell (1910). 17. Headley Lane (1913). As usual, on walls.

PHYLLITIS Hill. 536. (*SCOLOPENDRIUM*).

2277. **P. Scolopendrium** Newm. *Hart's Tongue.*

A number of records of this fern on walls and below railway station platforms in divisions 7, 13, 14, 17, 18, 19, and 20. Still found in these situations.

POLYSTICHUM Roth. 539.

2284. **P. aculeatum** Roth. *Hard Shield Fern.*

19. Lane S. of Oxted (1931). 23. Above Otford (var. *lobatum* Presl).

2285. **P. angulare** Presl. *Soft Shield Fern.*

7. Near Wormley West End. 19. Oxted (1930).

LASTREA Presl. 540.

2286. **L. Thelypteris** Bory. *Marsh Buckler Fern.*

9. There are two strong colonies of this interesting fern in the Forest not far from Epping. It was discovered in 1909 and is holding its own.

2287. **L. montana** T. Moore. *Mountain Buckler.*

9. Epping Forest, two stations. Ongar Park Wood. 14. Richmond Park. In good numbers in a plantation (Illustration in *Lon. Nat.*, 1934).

2288. **L. Filix-mas** Presl. *Male Fern.*

Recorded in divisions 1, 2, 4, 6 to 9, 13 to 20, 23, 24. Plentiful in 19 (Holmesdale). Appears even in inner London (Southwark, in an "area") if shelter and moisture is provided.

2292. **L. spinulosa** Presl.

9. In the Forest, near Epping. 19. Wood near Moorhouse, Limpsfield. Oxted.

2293. **L. aristata** Rendle & Britten **(dilatata).** *Broad Buckler Fern.*

Records in divisions 5, 6, 7, 9, 10, 13, 15, 19, 20, and 24. Fairly frequent in woods in divisions 9 (Epping), 19 (Holmesdale) and 20 (Blackheath).

POLYPODIUM Linn. 541.

2295. **P. vulgare** Linn. *Common Polypody.*

1. Fulmer. 7. Broxbourne. 9. Epping Forest. Woodhatch. Coopersale. 11. Near Kelvedon Hatch. 13. Esher Common. 17. Headley. Mickleham. 18. Titsey Plantation. Limpsfield. 20. Mottingham. Holwood. Bromley. Hayes.

Usually in hedgebanks. The Polypody used to grow in the crowns of old pollards in Epping Forest, but it is very rare there now.

OPHIOGLOSSUM Linn. 545.

2301. **O. vulgatum** Linn. *Adder's Tongue.*

4. Northwood. Harefield. 5. Potters Bar. 7. Near Hatfield. Botany Bay. 8. Nazeing. 9. Epping Forest. Sewardstone, etc. 13. Chertsey Mead. Weybridge. 15. Ashtead Common. Near Gt. Bookham. 18. Limpsfield Chalk Pit. 19. Oxted. Limpsfield Common. 20. Crofton. Holwood. Keston.

In damp grassy places.

94. EQUISETACEAE.

EQUISETUM Linn. 547.

2306. **E. maximum** Lam. *Great Horsetail.*

2. West Hyde. 6. Ken Wood. 7. Wormley West End. New Barnet. 9. High Beach. Passingford Bridge. 11. Weald Park. 14. Wimbledon Common. 15. Slyfield. 18. Barrow Green. 19. Titsey. Pains Hill, Limpsfield. 20. Chislehurst.

2307. **E. arvense** Linn. *Field Horsetail.*

Generally plentiful. In all divisions except 12, 18, 21 and 24.

2309. **E. sylvaticum** Linn. *Wood Horsetail.*

4. Near Elstree. 6. Bishops Wood. Golders Hill (1904). 9. Epping Lower Forest. 11. Childerditch.

This beautiful plant has not been found in the southern area.

2310. **E. palustre** Linn.

Not rare in the northern area. Divisions 2 to 6, 8, 11 and 12. And at 19. Oxted. 20. Chislehurst. Darrack Wood. Var. *polystachyum* Weigel is recorded at 2. Cassiobury Park. 11. Thorndon Park.

2311. **E. limosum** Linn.

4. Totteridge. Whitchurch Common. Stanmore Marsh. 9. Epping Forest (incl. var. *fluviatile*). Woodford. 13. Weybridge. 15. Great Bookham Common. 17. Epsom. 19. Limpsfield (incl. var. *fluviatile*). 20. Chislehurst Common. Darrack Wood.

99. CHAROPHYTA.

CHARA Linn. 553.

2329. **C. delicatula** Agardh.

13. Near Byfleet (L.B.H.).

2330. **C. fragilis** Desv.

8. Ditch by River Lea, Clapton. 9. Walthamstow ponds. Epping Forest.

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THE Society is an amalgamation of the City of London Entomological and Natural History Society, founded in 1858, and the North London Natural History Society, founded in 1892.

Meetings are held on the First Four Tuesdays in each month (except July and August) in the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, W.C.1. The room is open from 6 p.m. to 9 p.m., and meetings begin at 6.30 p.m. punctually and terminate about 8.30 p.m., unless other arrangements are announced.

The CHINGFORD LOCAL BRANCH meets at The Clifton Restaurant, opposite Chingford Station, at 8 p.m., on the Second Monday in each month during the winter months.

At these meetings specimens of Natural History interest are exhibited, and papers on various subjects are read and discussed. Visitors may be introduced by members of the Society, and are cordially welcome.

The minimum Annual Subscription for members is 12s 6d, and for associates 5s, but for members under 25 years of age the minimum is 7s 6d. New members and associates pay an entrance fee of 2s 6d. Subscriptions, which should be sent to the Treasurer, become due on January 1st. Members elected after October 1st pay no subscriptions for the current calendar year.

Each member and associate is entitled to one copy of "The London Naturalist" free; extra copies can be purchased by members, if supplies available, at two-thirds of the published price.

The Society looks with confidence for the support of all who are interested in the study of Natural History.

Further information may be obtained from the Secretary:—

A. B. HORNBLOWER, 91 Queen's Road, Buckhurst Hill, Essex.

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